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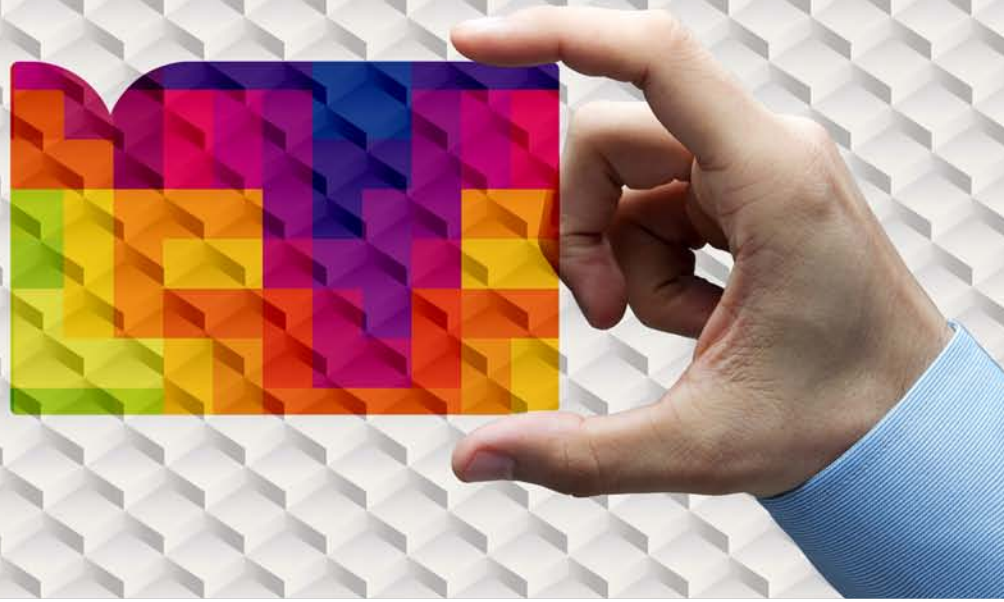
TechnoVision 2015

Technology Building Blocks for Digital Transformation



Foreword

Lanny S. Cohen

Group Chief Technology Officer,
Capgemini

As we consider the continued and rapid pace of business technology disruption and innovation across global markets in 2015, we have fewer and fewer points of stability, predictability, or maturity upon which to frame — let alone address — the opportunities and challenges presented to our businesses. More the rule than the exception, the way we think about business technology introductions and impacts — and the way we respond to them — requires a regular and fundamental rearchitecting and repositioning to accommodate the new.

Foreword

TechnoVision, I'm pleased to represent, is one such exception. Designed and developed with a keen appreciation for the fundamentals and core domains of today's business technology landscape, we've seen this body of intellectual capital and actionable references align and respond well to the continued pace of emerging technologies, and the business disruptions and innovations they enable. The TechnoVision seven-element framework and its building blocks — led by the Design for Digital principles — have been applied successfully and continually to industry segments, a diversity of enterprises, and countless process domains and technology environments. Hence, TechnoVision is proven in the massive and continuously disruptive markets we face.

Our 2015 version builds on these strengths and applications. Notable adaptations and refinements have been introduced, based on extensive field experience and feedback. Three overarching themes — Repositioning, Platforms, and Disruption — have been introduced to further contextualize the TechnoVision framework and design principles.

Move ahead boldly and quickly in your technology journey with TechnoVision 2015. You have the benefit of proven intellectual capital aligned to the business technology challenges and opportunities that enterprises face today. Its value remains in its insights, flexible application, maturity, and diverse audience engagement. It's fun to read and an infinite source of inspiration for dialog. We believe by focusing on and framing the most important questions and responses to becoming a Digital Enterprise, TechnoVision 2015 is a crucial asset for business technology leadership and strategies.

Enjoy and we remain eager for your feedback.

> "TechnoVision 2015 is a crucial asset for business technology leadership and strategies."

Introduction

Introduction

More than ever, information technology is *hot*. *The data scientist* is declared the sexiest job of the 21st century. *Coding* can build street credibility. Attendees of IT conferences flood major cities, increasing the gross national product of entire countries. Start-ups flourish more than ever, and as a result, the Silicon Valleys of the world enjoy denser traffic and towering real estate prices (all in good spirit).

And the enthusiasm is equally spread between all of us:

- As consumers, we enjoy our growing range of increasingly compelling and connected devices and applications, while becoming more insightful, social, and empowered.
- As business leaders, we leverage technology for the Digital Transformation of our organizations and enterprises, creating real value and genuine growth.
- As business technology professionals, we're exploring a whole new, powerful range of tools, platforms, and technologies to build the next generation of solutions.

Amid this digital euphoria, it's been an absolute pleasure for us to work on the 2015 update of our TechnoVision series. We're confident this almost infinite repository of viewpoints and insights will guide you through the technologies that will radically improve the performance and reach of your enterprise. If you liked TechnoVision 2014, we think you will agree that in TechnoVision 2015 there is a good mix of the loved familiar materials and

Introduction

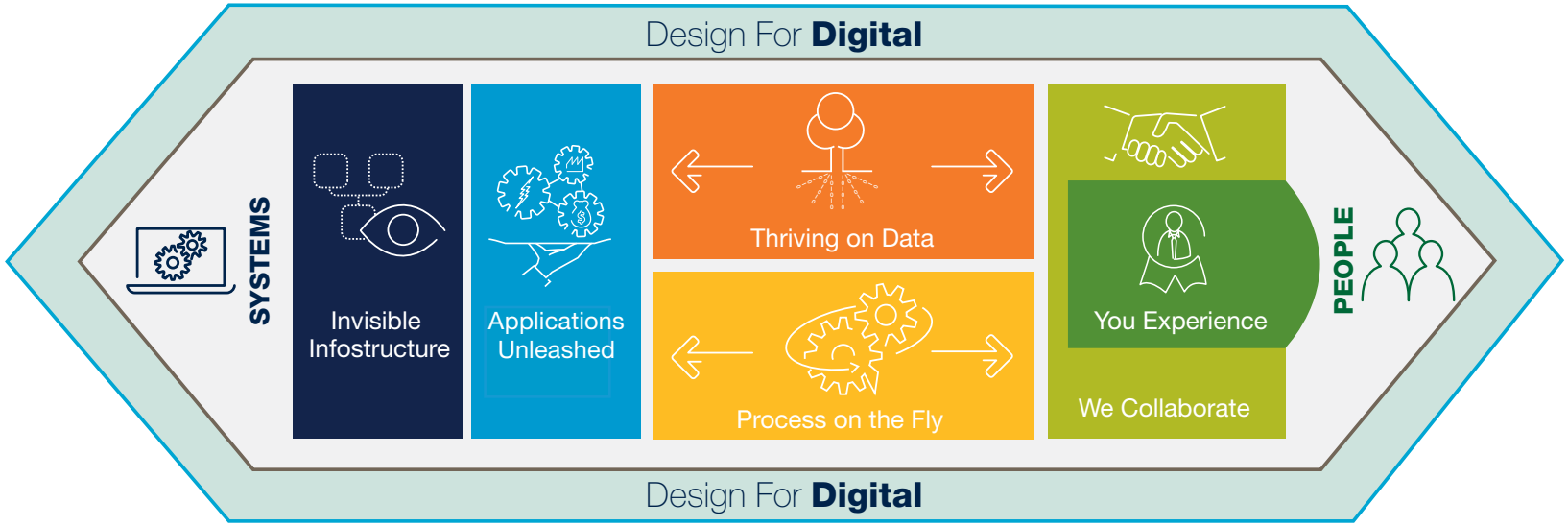
some strikingly new ones. We replaced one-fourth of the building blocks and thoroughly refreshed all others.

You can use TechnoVision 2015 in a structured way, systematically scanning the clusters and building blocks to see what's new. Many have also found it equally rewarding to navigate TechnoVision randomly through the content, looking for unexpected, serendipitous insights and ideas.

More importantly, you can use TechnoVision in the workplace to:

- Drive business technology strategy workshops
- Draw up architectural designs
- Conduct desk research
- Perform portfolio assessments
- Write articles and keynote speeches
- Hold Socratic group discussions and one-on-one dialogs

Introduction



We even use TechnoVision now effectively through our *TechnoVision Theater:* simple cardboard blocks and engaged groups of up to 70 people to understand and explore business and technology trends in a tangible, hands-on setting.

As you may recall from earlier TechnoVision versions, we categorize technologies with business change potential in six clusters, two of them covering the foundational building blocks of any IT landscape (Invisible Infostructure for infrastructure and Applications Unleashed for core applications); two of them covering crucial IT capabilities to deal with continual digital change (Thriving on Data for leveraging data and Process on the Fly to manage processes); and the final two providing organizational access to the outside connected world (You Experience for creating compelling, individualized user experiences and We Collaborate to tap into the power of social). Also, there is a cluster of overarching design principles that should be applied throughout: Design for Digital.

Like last year, each of TechnoVision's 37 building blocks is described through a separate topic in this interactive e-Book, featuring guest contributions of dozens of Capgemini's leading technology experts.

In the last post of each cluster, we cover several trend building blocks that push the limits of where technology can bring us — we're in the **era of disruption,** after all. The notion of **digital platforms** — as a way to

Introduction

bridge the gap between existing and new solutions, between business and IT, between the known and the unknown — is apparent throughout (watch every second to last building block of a cluster). Finally, it's crucial to understand how new technologies can **reposition** what you're already doing in business technology today. Every first building block of a cluster provides the basic overview of the technology area. Consider it for renewing your current IT landscape, for reassessing your project portfolio and for validating your Business IT strategy.

In addition to the building block descriptions, there are several topics with crucial, contextual insights that focus on topics including guidance on how to weave together the building blocks for different purposes, the integration with our perspectives on Digital Transformation and the Digital Enterprise, and next steps to take once you've internalized TechnoVision 2015.

So here are the 2015 building blocks:

Design For Digital. Contemporary design principles that should be applied to all business technology challenges within Digital Transformation.

1. Digitally Intense
2. What's Your Story?
3. Business Mon Amour
4. Bon Risk Appétit
5. From Train To Scooter
6. Platform No. 3
7. Hack My Business Model

Invisible Infostructure. Infrastructure that evolves into an invisible, but extremely information-rich and powerful platform for business.

1. Virtual Lego
2. Let's Get Physical
3. Build, Release, Run, Repeat
4. Orchestrate For Simple
5. What Would Amazon Do?

Applications Unleashed. Radically rationalizing the core applications landscape while benefiting from an abundance of next-generation, Cloud-based solutions.

1. All In A Catalog
2. Reborn In The Cloud
3. Elastic Business
4. API Economy
5. No App Apps

Thriving On Data. Providing real business value through actionable insights, distilled from an abundance of data.

1. My Data Is Bigger Than Yours
2. Real Real Time
3. Now You See Me
4. Data Apart Together
5. Cognito Ergo Sum

Process on the Fly. Creating and managing flexible, responsive processes that are in sync with the growth of business.

1. Shades Of Process
2. Process Is The New App

Introduction

3. Co-Process
4. Silo Busters
5. No Process

You Experience. Exploring the potential of the highly individualized, digital user experience.

1. No Keyboard
2. Object Of Desire
3. Get A Life
4. End User, End Producer
5. Digital Self

We Collaborate. Building on the power of the crowd to do better, different, and more business.

1. Social Is The New Oil
2. Egosystem
3. Social Workers
4. No Work
5. Friend That Machine

As said, each of TechnoVision's 37 building blocks features the invaluable contributions of dozens of Capgemini's leading technology experts. We've included their profiles at every building block for your reference. Don't hesitate to contact them for further information or discussion: they expect you to do so.

Think you can improve our perspectives? By all means share your builds with us; we like to keep TechnoVision fresh and relevant.

Happy exploring!

Ron Tolido
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Introduction

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Digital Transformation and TechnoVision 2015

Digital Transformation and TechnoVision 2015

Your expert
Pierre Hessler

To understand the relationships between business and information technologies, since its inception in 2007, TechnoVision always looked at business drivers first and at the technology building blocks needed to implement them, second. Starting with this 2015 edition of TechnoVision, we look at technology first and business second.

Why this kind of Copernican revolution? In the recent years, many of the drastic changes that TechnoVision helped understand and anticipate, have indeed happened. The most important of these changes is that people are now technologically fit — in their private, public, and professional lives. As a result, businesses have to be as fit — or run the risk of irrelevance in the eyes of customers, clients, partners, and employees. From the start, businesses and organizations have to factor technology into their thinking, strategies, and drivers. Without this integration of technology from the outset, businesses would craft useless, powerless designs and plans — dead on arrival, unfit for the digital world.

This is also why Chief Information Officers — offering technology services to implement business plans — are becoming Chief Digital Officers (or getting one as a peer). They bring technology thinking — and then services — to help craft and implement digital business change.

This revolution is making classical business transformation — where technology is just one of the implementation streams — obsolete.

A New Type of Transformation

Ahead of anybody else, Capgemini Consulting anticipated this consequence and created, four years back, the concept of **Digital Transformation.** It then engaged in an ambitious research program with MIT, the lessons of which are summarized in the Harvard Business Press book **Leading Digital,** published in the fall of 2014.

While the research with MIT continues, it has already shown that Digital Transformation differs from classical transformation in three essential ways:

1. Information and communication technologies are a compelling *reason* to transform the enterprise

2. These same technologies are the dominant *drivers* of transformation

3. The "to be" of transformation is the *Digital Enterprise*

Under the pressure from customers, clients, partners, and employees, many enterprises are racing to become digital. The ones doing it well — coupling transformation mastery and digital mastery — are gaining substantial competitive advantage, translating into faster growth and greater profitability.

Much of the focus is now on customer experience, where the objective is to offer customers, independent of the channel used, a consistently engaging acquisition and service story. The employee experience has to follow, to match customers' raised expectations. Demand-driven supply chains are developed to precisely deliver the precisely understood wishes of customers and clients. And new business models take advantage of our new ways of working, relating, and living.

Moving at the Speed of Technology Change

In the past, the "to be" of transformation, the transformed enterprise, had a life expectancy of a few years. Today, the Digital Enterprise is a moving target — moving at the speed of technology change. For example, the Internet of Things is rapidly becoming a reality, and it will trigger a new wave of transformation. Products and services of the enterprise will be its sensors into the world — extending it dramatically and constantly feeding back information on their working, their condition, the mood of their users, and their movements. The enterprise will have to gear itself to respond and react in real time, orders of magnitude faster than today.

Modern technology is so pervasive that nowadays everybody enjoys mobility, reaches into the clouds, behaves socially, and can even spell analytics. But familiarity doesn't mean understanding. TechnoVision 2015's ambition is to promote the understanding of current technologies, and to make it easier to grasp their business potential. It's therefore, conceived as a tool for Digital Transformation, providing:

- *Clarity* with the technology clusters as a stable taxonomy of key technologies

Digital Transformation and TechnoVision 2015

- *Understanding* through design principles and trends
- *Directions,* thanks to building-block descriptions that make business sense

With such an ambition, TechnoVision 2015 is not carved in stone. It will remain a *Work in Constant Progress* — just like Digital Transformation.

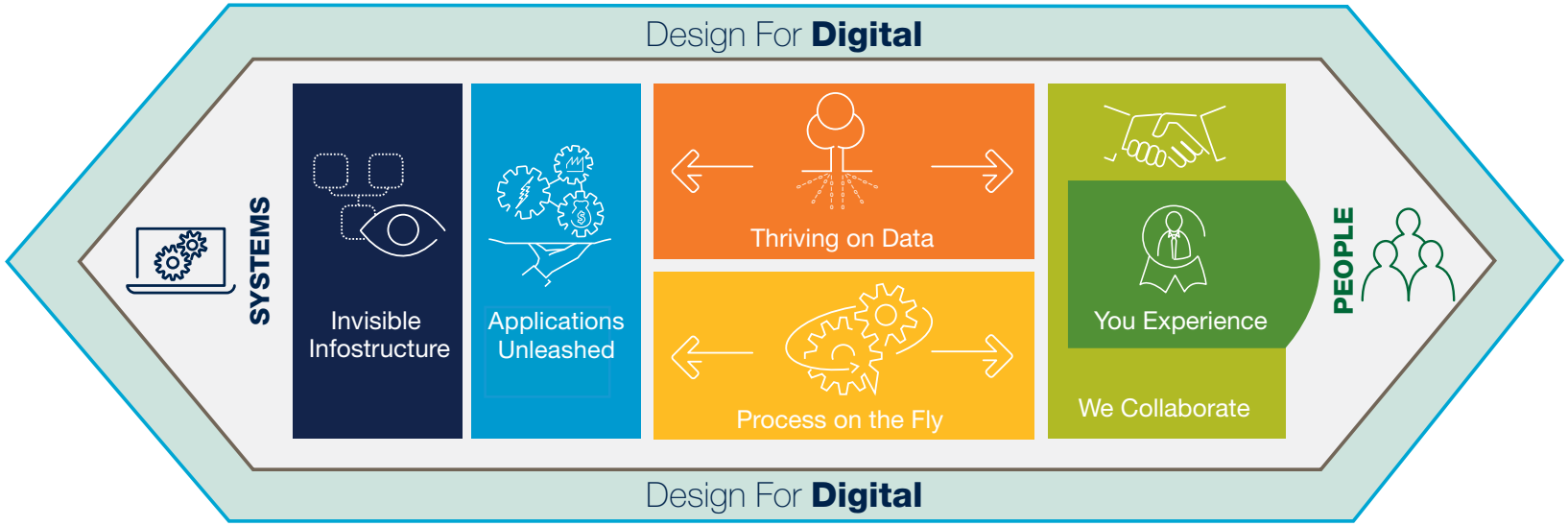
Clustering with a Purpose Within TechnoVision 2015

Clustering with a Purpose Within TechnoVision 2015

Your expert
Pierre Hessler

TechnoVision structures technologies into *seven clusters.* Luckily, perhaps surprisingly, these clusters defined in 2007 have retained their taxonomic and pedagogic value — while the building blocks they're made up of, have been revised several times, radically renewed last year, and again, significantly reviewed for TechnoVision 2015.

Clustering with a Purpose Within TechnoVision 2015



The first cluster surrounds all others. It's used to describe the evolving environment — open, service-oriented, in the Cloud, social — in which modern systems and applications are designed, developed, and operate. Last year, we gave it a new name for a new purpose: the ***Design for Digital*** cluster with seven *design principles*. The design principles are not descriptive, they're prescriptive. To be truly digital, the enterprise should *design* its *technology* in accordance with them.

Design for Digital took center-stage in many of our discussions and applications of TechnoVision. Now, we've revamped them based on what we've learned.

The six 'operational' clusters, the ones that help go from design to execution, are grouped in three **tandems**. One can look at them from a **people** perspective — how do we live technology? Or, from a **systems** perspective — how do systems work? Here we'll start from the systems. When discussing TechnoVision with business users, one would of course start from the people and social experience.

First Tandem: The Foundations of the Enterprise

The **first tandem** associates ***Invisible Infostructure*** and ***Applications Unleashed.***

In our personal use of technology, we're happy to ignore *infrastructure.* The *Invisible Infostructure* cluster groups the technologies that will allow enterprises to achieve the same objective: six or seven years ago a vision, today getting tantalizingly close!

For more than twenty years, ERPs have dominated and shaped the *application* landscape, giving it the structure that these monoliths proposed and imposed. The Cloud frees up the application landscape. Applications are no longer dominated by ERPs and traditional development. They come from all sources, like in catalogs. The whole world is now the enterprise's development organization. To reflect this evolution, the Sector-as-a-Service cluster has been renamed *Applications Unleashed.*

Second Tandem: Bridging Systems and People

While the first tandem addresses the technologies that are the foundations of the enterprise, the **second tandem** has an entirely different character. It groups those technologies that are needed to bridge the systems and software foundations on one hand, and people experience on the other, into two clusters: ***Thriving on Data*** and **Process on the Fly.** Without them, the enterprise could not participate in the modern use of technologies and therefore, could not be digital.

When *Thriving on Data* was born as a cluster, it could have been called Thriving on Big Data. However, the expression had not been crafted yet. And the cluster deals with more than Big Data and delves into data management, analytics, and the real advent of real time. Data is no longer the purview of IT and their systems; it's now used and generated by customers, networks, social media, and increasingly *things.* The Digital Enterprise is as much outside-in as it's inside-out.

The internal workings of a company obey well-defined processes. It used to be a major event called transformation, when these processes were substantially modified. For the company to entertain a different, permanent, and close relationship with its customers, and more generally with the world, such fixed ways of working will not do. The Digital Enterprise needs to react appropriately to customer situations and wishes. The *Process-on-the-Fly* technologies serve this purpose, and help achieve a long-held ambition to make the Digital Enterprise adaptive.

Third Tandem: The Visible Side of Technologies

With the **third tandem** of clusters, we come to the visible side of technologies, the ones we use every day. And it's by now clear that they can bloom, thanks to the first tandem, the base of all information systems,

Clustering with a Purpose Within TechnoVision 2015

and thanks to the second tandem, which provides the bridges between the enterprise foundations and the new world of technology, as we live it.

You Experience groups the technologies that give us a different way of working and living. The best of the smart phone apps embody them, with unprecedented levels of function, power and ease-of-use — not to mention fun. Not only do we enjoy them as users, we turn into producers of information and intelligence.

And technologies make it easy for us not to remain alone! Thanks to them, **We Collaborate,** and not only achieve levels of awareness and affiliation, but also of social power, crowd thinking, crowd creating, and crowd producing, which is equally unprecedented.

Technology developments come so fast and furious, mushrooming and confusing, that even professional watchers have a hard time keeping pace. To IT professionals, they can be distracting, even paralyzing. To business users, they all too often look individually promising, but collectively dizzying.

This is where TechnoVision 2015 helps. The clusters provide **order** and a form of **stability.** They're easily understood and positioned. And using the method described in the *How To* part of the e-book, one can assemble, following the clusters' logic, the building blocks which are relevant to the opportunity, or the problem at hand.

> "The TechnoVision clusters provide order and a form of stability. They're easily understood and positioned."

TechnoVision 2015 –

The Surgeon's Scalpel

The Surgeon's Scalpel TechnoVision 2015

Your expert
Pierre Hessler

37 design principles and trends look pretty overwhelming. Are you supposed to ingest and digest them all? And then, what's the use?

Not to worry. TechnoVision 2015 isn't an encyclopedia; It isn't a hammer in search of the right-size nail; It isn't a scimitar to attack throngs of technophobes. It's a scalpel — your scalpel — to understand how new technology design principles and trends can be applied to achieve a specific objective — *your* objective.

Here's how.

To take advantage of TechnoVision 2015 we suggest three steps.

First, have a look at TV2015's whole picture

The best entrance to TechnoVision are the 'Design for Digital principles' — evolutions or revolutions that change the way we think about technology for business. Read the seven descriptions several times, pondering each word — until you feel you could have written them yourself. Then look at the corresponding text — ask yourself if you would have come up with the same comments; even better, write your own!

Then pick the cluster you're most interested in, go through its building blocks and, with the help of the accompanying text, reflect on *'what's*

different?'— when compared with your knowledge and experience. Think through the consequences.

Finally, go through the other clusters at the level of depth you choose, remembering that they come in logical groups of two: *Invisible Infostructure* and *Applications Unleashed building* the foundation, *Thriving on Data* and *Process on the Fly* linking the foundation with the visible innovations: *We Collaborate* and *You Experience.*

Second, define what you want to achieve — specifically

Do you want to understand how new technologies can renew your thinking on a longstanding issue? Are you in search of new opportunities or new business models? Do you want to use TechnoVision 2015 to assess the capabilities your company needs to acquire or develop — to become a truly Digital Enterprise?

Do you want to provide a different context to one of your projects? Do you want to reposition another project to make it a step in your Digital Transformation? Or do you want to make this project future-proof?

As a CIO, do you want to engage with a business executive and whet her appetite for technology? As a business executive, do you want to go beyond the journalistic view of new technologies' impact on your business? Do you want to give fresh impulses to your strategic thinking? Do you want to provide food for new organizational thought?

Third, select the relevant principles and trends, and write your story!

With a topic and a clear objective in mind, you'll be ready to select the relevant principles and trends in one of the two ways:

- Directly, picking up the ones which you know will give you all elements for the solution story. For this you need a solid understanding of both the questions: what you want to achieve, and the tool TechnoVision 2015.

- In two steps: first exploring the context — for example innovation, or growth, or business and IT relations — and then zooming in on the specific question which will be answered through the story.

After selecting the relevant principles and trends, order them in the logical sequence, fitting what you want to achieve. This is the crucial step in writing your story: it transforms the elements of TechnoVision into the coherent subset you need. As a matter of principle, select and organize only a few of the principles and trends to start the discussion. It's easier to enrich the story rather than streamline it.

An example

The topic at hand is the relationship between business and technology, more specifically between the central IT organization and an unhappy business entity — love is definitely not in the air!

Let's approach it in two steps.

TechnoVision 2015 – The Surgeon's Scalpel

First, let's write the general story: as we learned from the Digital Transformation experience, we're entering a new era in the relationship between business and technology. In every development effort, one now takes, according to the principles of *Design for Digital*, the stakeholders' point of view (*What's Your Story?*). Then joint business technology teams create an integrated approach (*Business Mon Amour*). This way, businesses can make the strategic use of data (*Real Real Time, Data Apart Together*), leverage the power of social (*Social is the New Oil*), become adaptive (*Elastic Business, Shades of Process), and* develop new relations with customers (*End User, End Producer*).

Second, having whetted the business' appetite with this general view, you can move to the specifics. Let's work together for the benefit of the business entity's customers and develop, on new common rhythms (*From Train to Scooter*), a *Digitally Intense* experience for digitally enabled customers. To build this experience, we explore new forms of digital interactions (*No Keyboard*) for maximum differentiation (*Object of Desire*) — without forgetting to build the required new processes with our customers (*Co-Process*), an opportunity to break down internal barriers (*Silo Busters*).

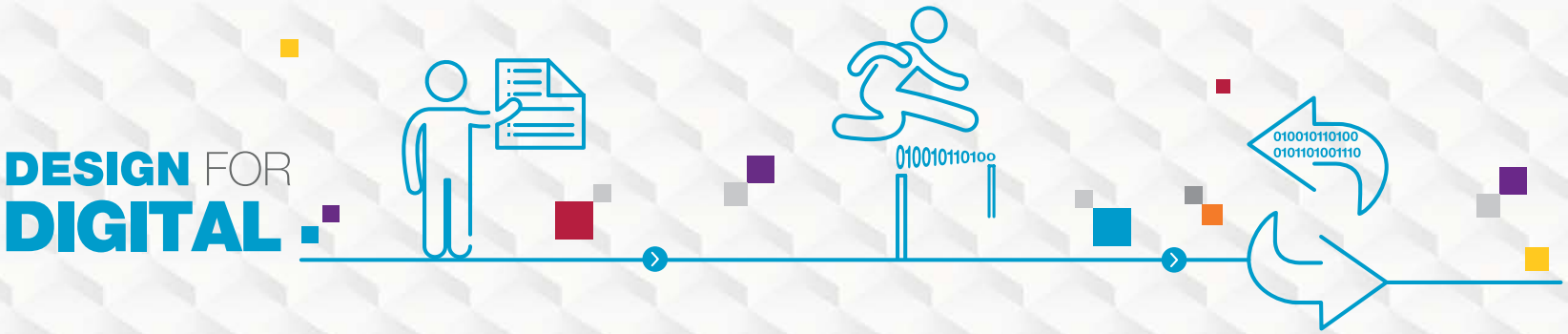
To sum it up, look at TechnoVision 2015 as your technology storytelling store. It gives you the building blocks and material to construct — with the surgical precision of a scalpel — the stories that will help you become the right Digital Enterprise.

TechnoVision 2015 –

Clusters and Building Blocks

- Design for Digital
- Invisible Infostructure
- Applications Unleashed
- Thriving on Data
- Process on the Fly
- You Experience
- We Collaborate

Design for Digital: Prescription for the Digital Enterprise



Your expert
Pierre Hessler

Digital Transformation isn't only about Digital Capabilities — understanding and mastering the technology drivers to business change. It's just as much — or even more — about Leadership Capabilities — the ability of an organization to create an executive-driven vision, an enabling governance, individual mobilization, and unified IT and business sides. Our Design for Digital principles point to the changes in mindset that are required to successfully enter the digital era.

In most discussions that use TechnoVision for input and inspiration, *Design for Digital* takes center-stage. Its principles resonate individually, but compel as a set of seven. They propose a very different way of looking at business, users, technology integration, and applications.

The principles of the TechnoVision 2015 edition reflect these discussions and show a radically updated perspective on how to design for digital:

- Our first two — ***'Digitally Intense'*** and ***'What's Your Story?'*** — build on ***some of the key lessons digital masters taught us***. The successful Digital Enterprise combines the right digital capabilities with the right leadership.
- ***Business Mon Amour*** advocates striving for the fusion of business and technology, rather than 'just' alignment.
- ***Bon Risk Appétit*** emphasizes the growing importance of security as a concern, but even more so as an opportunity.
- ***From Train to Scooter*** — a TechnoVision 'classic' — suggests we should understand and master business/IT transformation at different speeds and dynamics.
- ***Platform No 3*** is a plea to build digital platforms that marry enterprise-grade stability with next-generation agility; central with de-central.
- Finally, ***Hack My Business*** Model promotes a disruptive mindset for reinventing business models through new technology.

The design principles can be used as a state of mind, to shape an approach, and simply as a checklist for assessing and creating solutions. We hope they will be the base for another round of rich discussions and progress on the journey towards the Digital Enterprise!

Design for Digital

DIGITALLY INTENSE

Your expert
Pierre Hessler

For any organization to become a 'digital master', it needs to create sound digital leadership. This requires a deep understanding of how technologies drive the creation of a superior customer experience, the optimization of operations and even the reinvention of entire business models. It also needs a more-than-healthy appetite for understanding and embracing the next wave of technologies that, architected together, form the catalyst for Digital Transformation — mobility, insights, social tools, solution catalogs, and the Cloud.

Design for Digital

The classic enterprise depends on information technology for many of its business functions. But the *Digital Enterprise* is fundamentally different. It serves digital customers and partners at their own pace by a whole new set of rules. It plays the digital world's game.

More than *three years of solid research with MIT* has shown us what it takes to become digital masters and our foundational book demonstrates that it requires the right blend of *digital leadership* and *transformation leadership*.

In this first design principle, we focus on the essence of digital leadership, or in other words: what it takes to become *digitally intense*.

Understanding the ways this next wave of technologies transforms the business is a core capability. We distinguish at least three:

1. Technology informs — then amplifies — customer expectations. Through better customer understanding, leveraging digital opportunities for top-line growth and the creative use of multiple customer touchpoints, a superior **customer experience** is created.
2. Technology removes the traditional constraints in organizational **operations**. The increasing digitization of processes is key, as is the use of technology to enable employees do their work in different ways and drive effective performance management.
3. Finally, technology drives the era of disruption. Reinvented **business models** emerge from platform technologies, digital enhancements to products and services, and new, technology-enabled routes to a global market.

When crafting a new digital strategy, or reassessing an existing one, enterprises should establish their primary areas of impact.

Digital Transformation is driven by many different technologies and each organization needs to shape its own unique radar screen. A few developments in technology stand out and should be considered in concert to maximize impact:

- ***Mobility*** should be the 'alpha' and the 'omega' of every solution. Creating mobile applications worthy of the Digital Enterprise is not a matter of squeezing information into smaller (even if they're getting larger) screens. It requires considering the mobile device, including wearables, as the *primary way of relating* — the umbilical cord between enterprise, individuals and their communities.
- ***Insight*** — not just data — must be embedded into every move of the Digital Enterprise. Insight through *information*: every source of data has to be tapped, from the contextual through the social to the operational; insight through *interpretation*: data is given sense through analytics and visualization; insight for *action*: driving the next step of every process.

Design for Digital

- ***Social tools*** as the way to connect the organization to consumers, employees, partners and 'things' and tap into the collaborative powers of the crowd, whatever that crowd consists of. Social shouldn't be an afterthought, but should be a crucial, integral part of the design rationale of any solution.
- ***Catalogs*** are the foundation of quick, agile and enterprise-scale solution development. They provide industry best-practice solutions, processes and services to quick-start any chance initiative, providing the *art of the possible*. It's a matter of using as much of what's available, and only minimally adding what's different.
- ***The Cloud*** is the default power to draw on. It provides processes, platforms, solutions, and the underlying *Infrastructure-as-a-Service*: invisible in its deployment, simple in its management and infinitely scalable and flexible in its use. Although the Cloud may not entirely be the *de facto* enterprise standard yet, it sure has defined the new benchmark.

Effectively combined together, these drivers will increase the digital leadership of the enterprise through every *new project*. And it will even increase on a broader and faster front, if existing developments, ongoing programs, and existing solutions are *revamped* or *repositioned* to take even more advantage of true digital intensity.

WHAT's YOUR STORY?

Your expert
Maggie Buggie

While the name may suggest differently, 'Digital Transformation' is all about people. Whatever solution is shaped, it needs to be based on an outside-in perspective, designed from a deep empathy for what drives the people involved. And as we're only human, we prefer compelling stories above a long list of requirements, hefty specification documents and multi-layered diagrams. The ability to tell a story, and even better, to listen to one, is critical in creating digital experiences that actually excite and delight.

Design for Digital

Much of Digital Transformation focuses on the customer experience, operations, and new business models. In these fields, and in the next areas of transformation, new solutions have to visibly and powerfully help leadership turn digital investment into digital advantage. The best way to achieve that purpose is to move from the concept of ***or*** to the concept of ***and***.

The 'Digital Enterprise' as a 'social enterprise' deeply understands that people are integral to making the transformation vision true. It appreciates *people as individuals* and it appreciates the *power of the crowd* to intelligently co-create with customers, employees, partners, and others involved — in a culture of collaboration for mutual business benefit.

The priority of the Digital Enterprise is first, to respond to, and second, to anticipate every wish of its customers and provide them with a first-rate experience. The customer perspective is fast becoming the viewpoint from which all enterprise transformation is being assessed and shaped. Long-term growth and profitability depend on investing in the *front-end of the customer experience and* investing in parallel in *enabling capabilities*.

To successfully invest in enabling capabilities — such as adaptive operational processes — the *customer experience and* the *employee experience* have to be developed along symmetrical lines. We need to visualize a coin, the two sides being, the customer and the employee value propositions.

Finally, a key measure of transformation leadership is the corresponding evolution of *the enterprise* and of *its ecosystem*. Social has transformed the way in which enterprises conceive their place in the world and how engaged they're with it. They evolve their cultures through a process of co-creation and innovation; they harness the collective intelligence of their ecosystem and engineer their enterprises to use social to maximize the transformational impact of their solutions.

In such a world — with multiple perspectives — it's a matter of taking a radical outside-in approach, always taking the viewpoints and drivers of the individuals involved, as the starting point. Design Thinking should be a key inspiration here: it combines the notions of **purpose** (taking the needs of personas as input for envisioning *customer journeys* and *employee journeys*), **human-centricity** (tapping into the power of *empathy* and *compassion*) and **iteration** (mixing research, creativity, intuition and experimentation to jointly create solutions in an explorative way). Design Thinking certainly requires new skills such as creative design, human research, concept testing, and user experience (UX) development.

Above all, it requires the appreciation of a good, compelling story. If we start to live and breathe the stories of our customers, partner and employees — of our fellow humans — we're truly well on our way to become digital masters.

BUSINESS MON AMOUR

Your expert
Pierre Hessler

Digital Transformation needs a true fusion between digital capabilities and business change, not merely alignment. To earn 'business love', the IT department must successfully deliver, while sharpening its ability to innovate through technology. First, the requirements binder needs to go. Once seen as a bridge, it's now often perceived as a barrier between business and IT. Instead, digital platforms need to build the inspiration to jointly assemble the right solutions for change. The IT function is successful, if the business side happily takes the stage to testify about technology benefits, and the lead in Digital Transformation projects. Plus, holding a significant part of the budget doesn't hurt.

Design for Digital

Historically, love has not exactly played an essential role in the relationship between business and information technology. Mutual distrust is not the right Petri dish for love. Business never liked the IT black box — too much mystery, too much jargon, too much cost, too long lead times. IT never liked the business fortress — too arrogant, too much jargon, too many changes, too much impatience.

As they needed each other, they found a way of working together. Business puts together big binders of requirements, ships them to IT, which, a few months or years later, delivers the finished product — an application that, when it works, meticulously fulfills every requirement. Good in theory, frustrating in practice — the application by definition fulfills yesterday's requirements.

In the era of Digital Transformation, business and IT are condemned to love each other for one simple reason: *business without IT doesn't survive; IT without business impact, dies*.

Luckily, love has become so much easier. A natural emotion, you might say. Business people have become fans of modern technology. They now see it through the smiling faces of their smart phones, tablets and smart 'things'. IT people share this passion, and appreciate how technology changes business.

When in love, one speaks in a way that is easily understood by the partner — goodbye jargon! When in love, one spends lots of time together. Ideas are generated, separate strategies converge and become one, projects are integrated, responses come before questions — a single rhythm binds the orchestra. When in love, one experiences harmony and collaboration.

Utopian? No, a way of life for Digital Enterprises — and one of the keys to their success.

How do you know when business and technology are in love? Here are five indices.

1. They **burn the requirements binders** and adopt new preferences for creating solutions:
   - *Capabilities* over *Requirements*
   - *Value Scenarios* over *Use Cases*
   - *Working Prototypes* over *Specifications*
   - *Dialogs* over *Paper*
   - *Catalog* over *Custom-built*
   - *Joint understanding* over *Positions*
   - *Pictures* over *Descriptions*
   - *Stories* over *Structures*
   - *Platforms* over *Crafting*

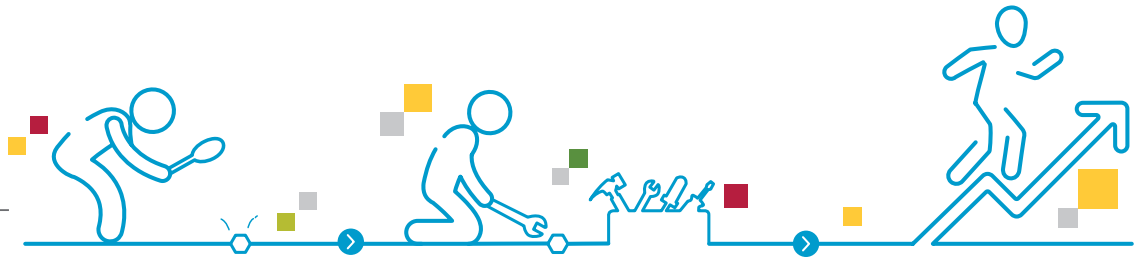
2. They work as **one team**. Enterprise projects are entrusted to teams assembling all necessary competencies and capabilities.
3. They start **before the start**, exploring and creating together. In the value chain, to ensure products and services truly fit the digital world, research and development includes information technology.
4. They draw **one architecture** only — the enterprise architecture depicts, in a single blueprint, the flows of business, their technology embodiments, and the envisioned changes.
5. And they regularly deliver, but **never end** their development; because, as a part of the world of networks, the enterprise needs to constantly adapt and connect and readapt and reconnect.

Whichever 'side' you're on, always consider if you've taken the effort to ensure **true love** on the other side. Digital Transformation is a long, but exciting journey and one shouldn't undertake it from the point-of-view of a 'marriage of convenience'.

Your experts
Bernard Barbier
and

Pierre Hessler

BON RISK APPÉTIT



On their digital journey, enterprises must always be connected to the outside world. This puts a strain on security. Openness and connectivity seem to stimulate their opposites. However, hiding behind an impenetrable corporate firewall is a digital passion killer and preparation for every security breach is an illusion. Instead of walling themselves off, organizations must develop a healthy appetite for risk, using smart tools to quickly detect intrusions and respond in real time. Furthermore, security must be an integral part of the solutions life cycle not an afterthought. A digital platform with built-in security actually enables new business, rather than preventing it.

The *Bon Risk Appétit* design principle is not about eliminating all risks — a near-impossible task. It's about doing business at the *acceptable* level of risk. It's also about taking a fresh perspective which not only makes the risks acceptable, but could turn them into opportunities — a new competitive advantage, or a disruptive business model.

The perspective has the following components:

1. Information security is no longer the purview of the IT department. It's the business, and notably the **top of the business**, that's taking over risk management as a key component of every strategic decision. For the Digital Enterprise, cyber-security is not just a condition for *survival*, but is also the way to create *trust*, an essential ingredient in dealing with digitally enabled customers and clients. Security thus, should become an *enabler* to new business; or even the catalyst for disruptive business models — that were unthinkable before new security technologies became available.
2. Information security should be built in as a central feature of the **enterprise digital platform**. Agile solutions can quickly be developed near the businesses that are also inherently secure. Furthermore, security should be embedded end-to-end in the solutions life cycle not as an afterthought, or exclusively in the domain of architecture, business analysis, infrastructure, or applications. Where mixed DevOps teams are quickly becoming popular as they remove the classical barriers between applications development and operations, it makes a lot of sense to make security experts an integral part of these teams.
3. At the center of risk-thinking is **enterprise data**. What's it worth? At what level should it be protected? Who should be able to access what? How to classify and archive it? How to destroy it? When? As the Digital Enterprise increasingly relies on its *IQ*, it focuses risk analysis on what makes it intelligent. A situational approach is crucial here: not all data is the same and there isn't a one size of security measures that fits all.
4. Not every security breach can be predicted and avoided in a black swan world. The **early detection** of any attempt to steal or corrupt data is key. Early detection minimizes damage in the same way that early recognition of software flaws minimizes the cost of error correction. Equipped with tools like HP's Security Information & Event Management, the security data scientist spots anomalous behaviors, unfolding attacks and initial damage, so that immediate action can be taken.
5. Risk management should always be done with the **customers in mind**. The success of the enterprise depends upon their trust. Customers deserve an accurate picture of their data from the use that is made of their information to the way the enterprise protects them as if they were their own employees. Their business will be their way to thank the enterprise. It's also a crucial cross-check that any security expert or risk manager should continuously make: are the measures we're taking still helping the customer to do business with us, or are they by now, actually preventing business?
6. Risk management should also be done with **partners in mind** — on their trust depends the success of the enterprise. Many are becoming Digital Enterprises, and these relationships will be rescripted to reflect new respective roles. An essential part of the script will be devoted to the type of intelligence, enterprises share and the type that remains their own. With that comes also an analysis of the risks, business partners are willing to share, including joint measures that should be taken to detect anomalies and respond in real time.

In any case, an open and situational mindset is crucial to give security its rightful place in Digital Transformation: as an enabler for business and a foundation for change. A perspective that surely whets the appetite.

FROM TRAIN TO SCOOTER

Your expert
Ron Tolido

The next generation of business technology solutions have a shorter time to market, are created and delivered in an agile way, and are developed and owned in the closest proximity to the business. These solutions are like 'scooters and cars', whereas the current application landscape typically contains 'trains and buses'. Think about when to apply the right rhythm. Build the platforms to support multi-speed IT and explore new, flexible ways to create solutions while applying agile approaches like Scrum and DevOps, as well as rapid development tools.

Design for Digital

In many organizations there's an increasing friction between 'Central IT' — in charge of the big core systems, ERP, and enterprise data — and business units, which can't wait to put their hands on the latest Cloud and mobile solutions.

The bulk of the budget belongs to Central IT, which uses it mostly to keep the lights on for the existing applications landscape. Their focus is on industrialization, simplification, and cost control. As a result, Central IT is becoming isolated from the business side, condemned to sustain existing systems with an ever-shrinking budget and not enough headroom to innovate. As a result, business units are understandably tempted by *bricolage IT* for short-term solutions at the risk of applications sprawl, redundancy, *data apartheid*, silo building and general sub-optimization.

To avoid this valley of delivery disillusion, we propose to distinguish, and then specifically manage, multi-speed IT, each 'speed' with its own dynamics, timing, economic models, governance, and design considerations. Therefore, each has its own development, testing and maintenance tools and methods, with its own capabilities.

Two of these 'speeds' pertain to the stable and naturally more centralized part of the IT landscape: in our transportation analogy, *Trains*, the industrial-strength backbone enterprise systems, and *Buses*, a bit more specialized and flexible. Two others are part of the business landscape, with the need to be fast and adaptive: *Cars*, supporting smaller, specialized groups, and *Scooters*, providing apps and tools for individuals or teams.

Connecting and keeping them all in sync, we distinguish a fifth crucial 'speed' providing the platform application services — in our transportation analogy, the *Station*, the hub of the enterprise. It takes care of synchronization, integration, integrity and security, and makes application and data services available. Building a digital platform — together with its key vision of releasing the notion of highly centralized control — is described in more detail in our upcoming *Let It Be* design principle.

Train-style development typically assumes solid requirements management, a clear distinction between IT supply and demand, predictable and definable outcomes, enterprise-grade systems and tools, and a medium- to long-term (waterfall) phasing of development and releases of solutions.

In the world of Scooters, agile solutions are rapidly built and released by joint teams of business users, developers, testers, and operations experts. They leverage digital platforms, notably featuring APIs and high-productivity development tools. What's available in the catalog determines the *value scenarios* that are delivered. Classic requirements are considered harmful.

As capabilities, resources, methods, tools, measurements, and key performance indicators vary widely from one 'speed' to the next, it makes sense to adopt an organization to manage them, each on their own, and also as parts of a whole.

Multi-speed IT acknowledges that the current business technology landscape is too varied to address through one, unified set of approaches and tools. One should probably not ask a builder of trains to create a fancy scooter. And vice versa.

Platform N°3

Your expert
Ron Tolido

The best things happen outside. It isn't only outside the organization where the crowd is already bringing new business value every day. Platforms are 'eating the world'. Now it's time for the IT department to unleash this energy within its own organization. A compelling digital platform that features APIs, open datasets, service catalogs, integration, frameworks, solutions guidance, tools, and collaboration enable business units to quickly create their own market-focused solutions while leveraging enterprise-grade information and services. It provides the best of both worlds, being at different speeds, 'letting it be' for the best digital results.

Design for Digital

Here are some whispered words of wisdom for IT departments that find themselves in times of trouble: *there may be an answer*. Let things be.

Interestingly enough, the business side is more enthusiastic about technology, than it has been in a long, long time. The Cloud, Big Data, social media, smart 'things', and mobile devices — all part of the emerging 3rd platform — have brought tremendous new opportunities for true Digital Transformation. No need for the evangelization of IT merits anymore. The IT department finds itself now, all too often, in the position of *blocking innovation*, rather than driving it, consumed, as it is, by keeping the lights on in the existing application landscape.

The key to dealing with this is not in desperately trying to stay in central control. It's also most certainly not in stopping de-centralizing initiatives by business units that aim to create their own solutions in the nearest proximity of the market.

Instead, CIOs should embrace the reality of multi-speed IT, gradually, but decisively, shifting the center of gravity from their enterprise systems to a **digital platform** as the *pièce de résistance* of the IT department. This platform — the 'station' between the 'trains' and the 'scooters' — bridges the stable and predictable world of enterprise systems with the agile, opportunistic world of Digital Transformation. It lets business units, partners and even consumers quickly create the next-gen solutions, they envision, while preserving crucial enterprise-grade qualities.

What then does a Digital Platform Look Like?

It's actually everywhere in the TechnoVision framework. For example in our vision on infrastructure, in which we describe an orchestration and integration platform — front-ended by a self-service portal that simply provides business workloads — as the ultimate Cloud instantiation.

It's also in our plea to consider the API as the application, opening up core enterprise applications through a catalog of service interfaces, or even rebuilding it as a set of loosely coupled micro-services.

Certainly it also surfaces in our description of the new data landscape, leveraging open data, master data management and Business Data Lake technologies to provide any perspective on data — if necessary in real time — without imposing restrictions on storage, structure, or access.

Often underestimated, but extremely powerful, is the use of Business Process Management solutions to bust the silos of existing core processes, giving the business, the opportunity to augment, improve, and even create brand new processes without having to touch a single line of code.

Design for Digital

Finally, the best producers of mobile apps might be end producers — wherever they are — as long as they're provided with the right power-tools, frameworks, and APIs to create compelling, yet enterprise-grade solutions themselves.

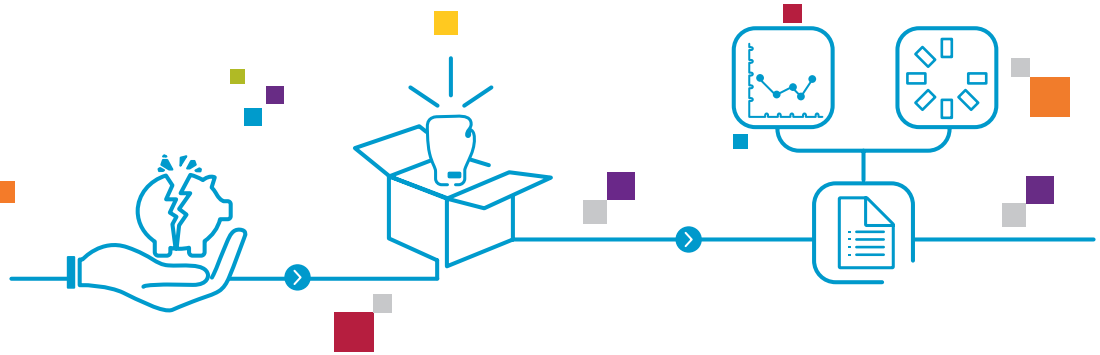
As with any *platform play* — even when it's eating the world — the success of a digital platform is determined by how attractive it is to both the supply and the demand sides.

In order to be the keystone species of the enterprise ecosystem, the IT department needs to be in a continuous, *hothouse dialog* with its business stakeholders, co-creating parts of the digital platform on the go. Opportunistic decisions are good; an agile approach based on a bold architectural vision of change, even better.

Showcase projects that deliver early business benefits on the first components of the new platform are extremely valuable. They provide a healthy balance between the digital impatience of the business and the monumental task of modernizing the IT landscape.

Burning platforms need digital platforms; so that Digital Transformation can be.

HACK MY BUSINESS MODEL



Your expert
Ron Tolido

New technology is the engine behind radically reinvented business models. The age of digital disruption comes in two flavors, depending on if enterprises choose to thrive on disruption, or are simply confronted with it. Creating disruption needs an open mindset, bypassing what's established, and thinking the unthinkable. Although it seems oxymoronic, there's actually a system behind digital disruption. Dealing with disruption, whether it comes from the outside or not, requires a responsive digital platform and an agile organization. A Black Swan world asks for Black Swan measures.

Nassim Taleb's equally relevant and amusing The Black Swan describes the phenomenon of the titular bird as a metaphor for unpredictability and disruption. You see, until the end of the 17th century the inhabited western world presumed that there were only white swans. This insight was based on observation and a bit of extrapolation: as far as the eye could see, only white swans were present. This always had been the case. Therefore, everything indicated that in the future, the situation would be the same. Until 1697, when Dutch explorer Willem de Vlamingh sailed into the still unknown continent of Australia and bumped into flocks of black swans on the very first river he took.

Black swans occur when we least expect them and they cannot be predicted based on what we know and see. Clearly, the new wave of digital technologies — Cloud, Big Data, social, mobile, 3D printing, the Internet Of Things — is creating a whole new bunch of black swans; especially when these technologies are combined to create products, services, and business models that have never been seen before, or were simply deemed impossible.

By now, we all know the striking examples of digital newcomers that are shaking the core of incumbents with compelling products, low prices, and lightning-fast delivery. Not constrained by the usual obstacles, they offer propositions in new and unique ways. Ask taxi companies, travel agencies, bookstores, record companies, hotel chains, and newspaper publishers. It's easy — and tempting — to envision a *valley of doom,* where enterprises will end up if they don't take immediate action.

The good news: disruption can also bring phenomenal opportunities to established enterprises, as long as they choose to thrive on it and leverage their corporate assets and qualities at the same time.

Even better, disruption is not just a matter of unleashing raw creativity, hoping a decisive moment of epiphany will magically occur. There's actually a system to it.

In Leading Digital, five archetypes of digital business model reinvention are described:

1. **Reinventing industries** involves substantial reshaping of an industry structure, as Uber did for the taxi market, Airbnb for lodging, and iTunes and Spotify for music. In all cases, this involves introducing a business platform that equally attracts buyers and suppliers, leveraging economies of scale to an extent that is very difficult to match by existing businesses. Yes, software and platforms are eating the world. And that's great for a business. If it's part of it.
2. **Substituting products or services** directly replaces core products or services with a new digital format. As technology is virtually unconstrained, there is no reason why products and services that can be digitized, are sooner or later, replaced by their digital instances. Whether it's in books, music, snail mail, or 3D printing, in many cases organizations must cannibalize part of the existing business in order to embrace the new format. Look at Netflix for how it's done, or at Post Danmark.

3. **Creating new digital businesses** involves the creation of new products and services that generate additional revenues. Established enterprises are at an advantage here, as they have the phenomenal opportunity of leveraging their existing assets and brand with digital augmentation. The Internet Of Things brings lots of inspiration here and brands such as Nike, New Balance, and L'Oreal lead the way.

4. **Reconfiguring value delivery models** means recombining products, services, and data to change the way an enterprise plays in the value chain. Using technology to connect products, services, and information in a different way can build new stickiness with customers and enhance competitive advantage. It may often involve *cutting out the middle man* — clearly demonstrated in insurance, retail and travel — but companies such as Volvo prove that it's possible to open new, direct channels to the client while enriching existing (dealer) channels at the same time.

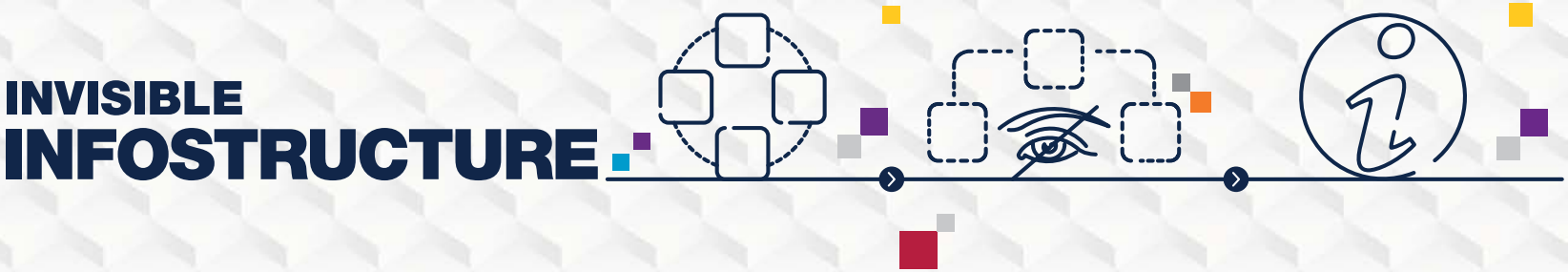
5. **Rethinking value propositions** uses new digital capabilities to target unmet needs for existing or new customers. Reinventing business models isn't always a matter of being disruptive: it can also mean taking a fresh, *repositioning* perspective on existing products, services, and assets and simply using the next wave of technology for renewal. Insurance Company, Tokio Marine used mobility and real-time data to create 'one-time' insurance for very specific purposes and circumstances. Media Company, Entravision used the fine-grained customer behavior data it was collecting to set up Luminar: an entirely new analytics business.

There are many more ways to design for disruption. TechnoVision 2015 describes numerous technology trends that hold disruptive potential, particularly the last ones in each 'cluster'. Have a look for example at What Would Amazon Do, Cognito Ergo Sum, Digital Self and Friend That Machine for fresh inspiration. It often takes a radical outside-in perspective to find true disruption and design thinking can come to the aid here, just as much as reaching out to the ecosystem of start-ups (guided or not), as *innovation tends to happen elsewhere*.

Finally, no matter how an enterprise finds itself at the sending or receiving end of disruption, an open, digital platform is a prerequisite for agility and responsiveness. The API Economy provides essential reading, just like End User, End Producer and Data Apart Together. Clearly, businesses need to at least understand the mindset of a start-up — if not master it — and Train to Scooter dynamics provides an introduction to it.

It's going to be an exciting roller coaster ride and we may equally enjoy the views of *valleys of doom* and *mountains of growth*. Oh! And if you bump into them: say hello to the black swans!

Invisible Infostructure: What Infrastructure at-its-best, Should Look Like



Your expert
Gunnar Menzel

The days when we had to meticulously design, construct, and implement our own unique and dedicated IT infrastructure, are almost gone. Instead, we welcome an era that consumes 'right from the catalog'. We use powerful, pre-defined services and workloads that support us, like a truly hassle-free utility that satisfies any 'business technology' objective. Combine this with the incredible richness of information — through sensors, mobile devices, and all those 'things'—and you start to get both the 'Invisible' and 'Infostructure' part of the equation.

"Invisible" doesn't mean we can ignore IT. The infostructure is at the heart of the enterprise, and as such, it requires careful and appropriate consideration. It needs to provide secure and reliable access to application services and data that mixes old and new deployment models, and existing and innovative technologies alike. This will require nothing less than an orchestrated journey that must navigate this hybrid reality, for years to come.

The Cloud clearly takes the lead in accelerating infrastructure innovation, and so do the next generation of mobile, social, data, and process technologies. Together, they constitute a highly agile *3rd platform* (after the mainframe and PC platforms that we're so familiar with), bringing with them, unprecedented opportunities for enterprises to grow without having to deal with the complexities of the underlying technology.

In the end, this is where we believe infrastructure is at its best: invisible, yet relevant and incredibly insightful, focusing on what matters most — business outcomes.

VIRTUAL LEGO

Your expert
Ajith N C

Virtualization is the key ingredient for rendering the IT infrastructure invisible, and accelerating the journey towards the Cloud. It reduces costs and deals with the mounting complexity of divergent technology platforms. But, there is more. When infrastructure is rapidly composed and recomposed from 'Virtual Lego' building blocks, it enables businesses to become more agile, more responsive, and a lot faster. In short, it's a complete, software-defined infrastructure solution stack that is deployed in minutes on any scalable, manageable 'container' platform. If it weren't so real, it would pretty much become a metaphor for running a business with similar qualities.

Fueled by new and enhanced virtualization technologies — and accelerated by the insatiable demand for computing power — infrastructure advances rapidly. Even though virtualization has existed since the 1960s (originally as the logical partition of mainframe computing resources), it has now significantly evolved past the simple abstraction of pools of processors, memory, and storage. Indeed, virtualization is coming of age, with capabilities, combined in containers that are literally *business-aware*.

Software vendors drive the further evolution of compute 'hypervisors' and enable new types of abstraction at various layers of infrastructure. Hardware vendors deliver pluggable modules for hardware virtualization, and push on-chip management and security components. Intelligence is being aggregated from the hardware stack into the hypervisor layer, and being integrated closely with powerful orchestration platforms to automate operational tasks, thus providing a single *pane of management*.

It's neatly illustrated through concepts such as Software Defined Data Centers (SDDC) and Software Defined Networking (SDN) and enabled by industry standards such as OpenFlow and OpenStack.

Hyper-convergence takes it a few steps further, often in the area of Cloud infrastructure. At its heart is stopping compute, network, storage, and software living on their own. Instead, it intimately connects and integrates them, packaged into highly virtualized, self-contained and infinitely scalable appliances ('boxes' really, as illustrated by platforms such as SimpliVity's OmniCube and Nutanix).

Another, arguably even more 'virtual' way, this trend materializes, is through *software containers* (such as the very young, yet remarkably popular, open source-based Docker platform). They support fully self-contained application 'packages' which can run on any operating system platform and in any deployment scenario, whether it's a public Cloud, private Cloud, or even 'bare metal'.

It doesn't need too much imagination by now to see the link with Lego.

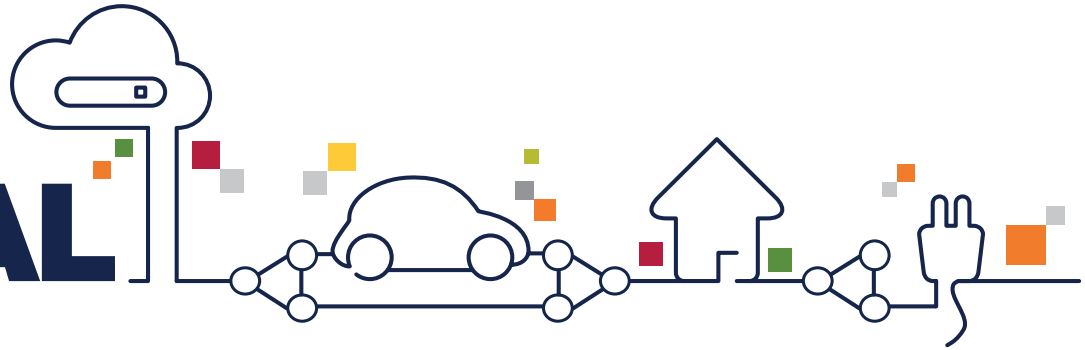
The power of Virtual Lego obviously helps to squeeze the most out of an infrastructure, and manage complexity. But more importantly, it massively drives down speed to market. Take a typical SAP ERP environment: using the 'traditional' approach may take weeks, if not months, to add another ECC instance. But applying virtual, pre-defined, and ready-to-run components, the design, build, test, deploy, and implementation can be done in minutes!

Nothing more than a *pipe dream*? Far from it. This is a real example.

This is where infrastructure directly meets business, together building on a *cellar-to-ceiling* capability, combining compute, network, storage, and software to create real business outcomes in minutes, rather than weeks or months.

Simple building blocks, unlimited and immediate possibilities.

LET'S GET PHYSICAL



Your expert
Corey Glickman

While we tend to associate technology with the virtual world, the physical, 'real' world is equally a part of it now. With a multitude of tangible objects that are connected to the network, sensing and storing data, the boundaries between both worlds are quickly blurring. The Internet of Things provides unlimited opportunities for organizations to become smarter and get more intimately linked to their customers and partners. The trend comes a full-circle with the rise of 3D printing, which allows enterprises to materialize ideas and concepts in ways that were previously unthinkable.

Let's stay safely away from definition games and simply assume — together with our trusted friends from Wikipedia — that the Internet of Things (IoT) is the "interconnection of uniquely identifiable embedded computing devices within the existing Internet infrastructure". Estimates differ, but the near future (2020), is likely to feature powerful networks comprised of 50 billion connected, intelligent objects!

In such a world, *anything* connected to the network spews data. To collect and analyze that data, the infrastructure truly becomes an *infostructure*: a foundation that builds new business capabilities on top of things, devices, wearables, and even smart 'matter'. Data, intelligence, and analytics capabilities thus form a crucial component of any infostructure linked to the IoT.

Another key component will be to provide access to smart objects through open, standardized and catalog-based Application Programming Interfaces (APIs), where the technology inside the actual objects in many cases will not be within the domain of the IT department, but will certainly be accessed through APIs, instead. This makes Intel's acquisition of Mashery all the more understandable.

New architectural frameworks are required to address the significant technology and business challenges. Along with an initial focus on application development, sensory analytics, and a new IT infrastructure, these frameworks will need to include (open source) machine architectures, governance, regulatory provisions, and the type of security capabilities that can provide adequate security for the users of those 50 billion connected things.

Organizations are forming consortiums (such as the Open Interconnect Consortium), providing development platforms (such as IBM's IoT Foundation), and exploring new industry standards (such as HyperCat) to drive IoT adoption.

Furthermore, it's important to realize that the Internet was born from the need for humans to connect with other humans. As a consequence, the Internet has a starring role to play in providing *'real-world human context'* to the IoT picture. Even though, a substantial part of the communication between objects within the IoT will be Machine-to-Machine (M2M) in nature, tracking human behavior and offering predictive new desired features for customer needs will be the true measure of success for the IoT.

For a practical real-world example, let's look at Phillips that allows external developers to use IFTTT (*If This Than That*) API scripts for their smart products, like the Wifi HUE light bulbs. By releasing more products that can be accessed through IFTTT, Phillips allows customers to mash-up customized IFTTT 'recipes' and share them with the outside world through a dedicated website. Phillips then analyzes how consumers use their products and what new features they might desire in the future, thus driving smarter product releases.

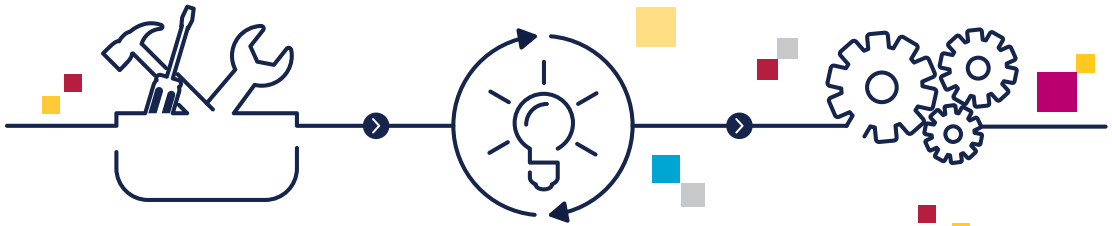
Only 'things' do not become 'virtual'; the reverse is happening as well. In 2014, General Electric successfully used 3D printing to manufacture an entire, functional jet engine. 3D printing is clearly coming of age. 3D printing — or *additive manufacturing* — is the process of making three-dimensional solid objects from a digital definition. The virtual design of an object is made using a 3D modeling program (or a 3D scanner to replicate an already

existing object). These objects can be printed with embedded intelligence, by infusing unique identifiers within the objects during their creation. It's yet another illustration of blurring of the physical and virtual worlds.

Authoritative market estimates describe an IoT revenue pie of over 10 trillion dollars in forthcoming years. That makes a strong incentive for existing and future businesses to claim a slice. Businesses will need to address the balance between the physical and digital world through *'make', 'buy', 'partner'*, and *'crowdsourced'* models. The IoT is no longer a futuristic projection: it's happening right now and true value creation depends not only on smart data gathering and analytics, but on solving identified human needs.

Architects will need to design and deploy a stable, secure, and open platform to fully leverage the potential of the Internet of Things in all of these dimensions; even if it's not always clear how smart objects will create value. When such a compelling platform emerges, infrastructure becomes *infostructure*.

BUILD, RELEASE, RUN, REPEAT



Your expert
Gunnar Menzel

Enterprises are raving about DevOps: the agile, perfect fusion between IT Development and IT Operations. By using one unified and highly automated 'train' of tools, DevOps teams develop applications, test, integrate, and package them for deployment. Plus, they make them live in a continuous, uninterrupted flow, many times a day. It requires a thorough understanding of what components constitute a state-of-the-art DevOps platform. Also, it needs a true mastery of the agile approach at the business level. Arguably, it eats away the barriers of the solution life cycle, bringing experts together in high-productivity teams that 'never sleep'.

Invisible Infostructure

The speed of application development, and notably application change, is increasing — particularly in '3rd platform' areas around Cloud, mobile, social, and *real real-time data*. The typical Car and Scooter dynamics require going through the entire solutions life cycle in days, hours, or even minutes. But at the same time, the necessity of a rock-solid quality of solutions is paramount: our very business performance depends on Digital and we cannot afford mistakes, because we're in a hurry.

Here's the conundrum: we want it ultra-fast *and* of the highest quality, whilst being totally in control.

A new, exciting approach addresses this apparent oxymoron: DevOps. A portmanteau between 'Development' and 'Operations', it's a concept that connects developers, quality assurance, and infrastructural operations in such a way that the entire "build, release, run repeat process" operates as a continuously producing factory. It features clear roles, responsibilities, inputs, and outputs and as such, requires a mature, established governance to get there.

The main aim of DevOps (check out our definitional white paper) is to revolutionize the change process, de-risk IT deployments, delete the stereotypical "but it worked on my system", and eliminate the silos between developers, testers, release managers, and system operators.

The tools and products that are being developed in this space, all focus on maximizing predictability, visibility, and flexibility, while keeping an eye on stability and integrity. With the advent of open-source and Virtual Lego, a DevOps team can simply construct any environment, it needs. It's an area that many tend to focus on first: to create a *train* of specialized tools that allow for an almost automatic execution of the solution life cycle — all the way from change requests via versioning, development, integration, testing, configuration, packaging to deployment on the live-run environment. Examples of these 'tool train' components include Docker, Puppet and Chef, as well as newer entrants like VMware's vRealize Code Stream.

Let's look at an example. Imagine you're a developer creating a code for SuSE Linux, who's developing a 3rd platform-based application, using a Cloud-based development environment. In order to test your application, you need to move the code plus configuration information to a separate unit-test environment and once tested, the application needs to be installed in a 'user acceptance test' environment. Once users have OK'd the app, it requires a last performance and security test — all before it can be deployed on a live environment, which sits in an on-premise, private Cloud.

Before the era of DevOps, you would have requested each and every move and construction via an Environment Manager, using an internal (and maybe only PC-supported) proprietary change management system, taking days and sometimes weeks. Not to forget, all the issues that would arise from subtle differences between the approach of various "sysadmins" involved, resulting in a divergent nightmare of test and target platforms.

Fast forward: in a DevOps team, you use the expressway. You work with the same UI and tools as all your colleagues in a tight, multi-disciplinary team; you have the ability to create, deploy, and destroy an environment using standard templates and blueprints, increasing the ability to shortcut fault analysis to your code, only. You can kick off full, pre-defined install sequences, eradicating the need to manually install anything. What's even better is, it supports any target platform, be it Unix, Linux, Windows, or even Mac mainframe, installed either on- or off-premise, virtualized or non-virtualized.

You're not cutting corners here. You're simply going to benefit from the highest degree of automation and standardization to repeat the entire solutions life cycle over and over and over again at supersonic speed.

It requires mastering agility at all stages and it needs perfectly aligned teams with committed specialists from all crucial disciplines: developers, testers, *and* operations. Now would be a good time to get them acquainted. And probably it makes sense to start exploring the new approach, only in the most suitable areas first: mobile and Cloud-based applications first, rather than the critical, core-applications space.

Once *in flow*, an optimally tuned DevOps team can set a shining example to the rest of the enterprise.

Build, Release, Run, Repeat. All before lunch.

What if the business could do that too?

ORCHESTRATE FOR SIMPLE

Your expert
Har Gootzen

Cloud is really here to simplify and improve business life, not complicate it. Organizations see the obvious benefits of the Cloud. However, they often get stuck in managing the complexity that comes with it. Dealing with issues around integration, security, hybrid deployment, vendors, standards, and service levels can absorb so much time that the benefits often appear to be illusive and distant. It requires an orchestrated approach to the Cloud, ensuring that complexity is dealt with, effectively, and services are provided through a platform of easy-to-consume services. This provides organizations with a path towards leveraging the Cloud that they can follow, on their own terms. Also, it frees-up their management agendas to fully focus on creating new value.

By its clinical definition, orchestration is *the advanced automation proposition to dynamically organize, provision and integrate a set of IT-based services and solutions in a hybrid Cloud environment under policy control, to provide coherent, consumable services to enterprise users*.

What does it mean in practice? Well, an orchestration platform *stitches* together various Cloud services — public, private, or hybrid — to provide easy-to-consume business services. Besides this 'stitching' of cross-Cloud services, other functions and layers need to be part of the orchestration capability. Services from different Clouds, vendors, and providers are abstracted to a common level, in order to make them 'executable' by the orchestration platform. Integration and aggregation functions take care of exposing traditional data center services to the orchestration platform. *Brokering* lets the client *mix-and-match* Cloud services from external marketplaces. Brokers emerge that add value to private and third-party Cloud services by unifying service-level parameters, reporting and billing.

To illustrate the relation between orchestration and brokering, imagine the ordering process for a fully configured and ready-to-use server platform being delivered as *Infrastructure-as-a-Service* (IaaS). This is referred to as *resource orchestration*. The user triggers the process from a portal that provides access to the service catalog of ready-to-use IaaS components. The orchestration platform handles the end-to-end automated provisioning of these components — such as a specific application server instance — including applying involved business rules like authorizations, financial controls, and capacity checks. The brokering function presents the user with a choice between private and public Cloud resources.

Eventually, it's all about the workload.

The next logical step is *workload orchestration* instead of *resource orchestration*. Business workloads are given the infrastructure resources they need, based on business policies. The workload orchestration platform ensures that the right workloads are made available to the business (e.g. an ERP solution, a productivity application, a full DevOps environment, or a mobile back-end application), providing the workloads transparently across public, private, and on-premise environments. This requires an even higher level of abstracting the infrastructure — another move towards the ultimate concept of an 'invisible' infrastructure.

The brokering of third-party Cloud marketplace services is quickly establishing its place within the 'business technology' strategies of enterprises. It's often better to build on these services rather than spend time and money on the in-house design and development of services. The build phase will then be all about *integrating* and *aggregating* these services. The more powerful an enterprise Cloud orchestration platform is, the easier this transition becomes.

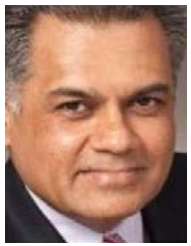
If an enterprise has until now avoided taking the leap into the Cloud, it will find that an orchestration platform can significantly help make the transition painless, seamless, and as gradual, as desired. If the business is already in the Cloud, it will finally unleash the full benefits by moving to a purpose-built, rigorously tested, and a fully integrated orchestration platform.

With enough time, people, and investment, an enterprise could create its own orchestration service from the ground up. But there's no reason to reinvent the wheel when these robust and tested platforms already exist today, as commercially available best practices across the Cloud industry.

After all, a Cloud orchestration platform is a means to an end, not the meaning of life (at least for most of us). Enterprises want to grow and innovate, using Cloud services. A Cloud orchestration platform enables them to do so, without ever losing focus on their business objectives.

It's as simple as that.

WHAT WOULD Amazon DO?



Your expert
Harish Rao

Most of the striking innovations in infrastructure serve the key objective of the enterprise: creating a superior customer experience. So why not go the full circle and learn from some of the greatest retailers in the world, to envision the next steps in infrastructure? As consumers, we all know the power of the web stores — the likes of Amazon, Apple, BestBuy, and Gap. It only takes a quick look at Amazon Web Services to see what happens when IT gets the 'high-volume, low-margin, rapid-delivery, great web experience' treat of an online retailer. Infrastructure must become a high-value commodity to the business. Want to challenge yourself? Regularly ask what Amazon would do.

It's still an established benchmark for any application developer building a web shop — before starting to discuss structure, activity flow, and layout — to take a look at the world's leading example and see what's hot. *What would Amazon do?*

Well, they're doing it again. This time it's about IT infrastructure and, more frequently, business applications.

With an ever-growing catalog of infrastructure services from the Cloud and a still rapidly expanding AWS (Amazon Web Services) marketplace, Amazon shows any IT department what they're up against in the near future: a neatly organized, easily accessible catalog of open, highly standardized, secure IT services, ready to deploy in seconds, paid per use, all in one invoice. And of course, at incredibly competitive prices. In its eight years of existence, AWS managed to lower prices dozens of times, all in the best tradition of the highly optimized retailer that they are.

We've often discussed with our clients how quickly — and through what steps — they could benefit from the public Cloud; and the same advice is given over and over again. We're not saying an enterprise's entire IT landscape should be on the Amazon Web Services public Cloud next year. But it's quickly defining a new normal in terms of how fast, easy, and cost-effective a business should be able to procure and deploy new solutions.

That benchmark becomes apparent from the AWS marketplace (or for that matter any comparable service from, for example, Microsoft or Rackspace).

Go to it yourself and browse around a bit. Will your IT department be able to provide the same compelling catalog with the same self-service, usage-based pricing, and deployment in minutes? Even more importantly: are your prices more or less on par with what Amazon is offering?

Amazon Web Services is taking a retail perspective on IT: it aims to provide high volumes of excellent quality at low prices and uses its impressive growth to further sharpen its proposition. It's not a coincidence that the AWS marketplace starts to resemble the Amazon web shop. You can only imagine what will happen when more business applications become available (anybody for a recommendation engine?) through the very same marketplace.

How is it all achieved? The answer is partially in speed. Amazon is a build, release, run, repeat master. Where many competitors struggle to successfully deploy application changes once a week without breaking live operations, Amazon is deploying more than 1000 fully automated and fully tested deployments per hour.

So what does a truly invisible infrastructure look like? Where do Virtual Lego and Cloud orchestration eventually lead? It might be as simple as an exciting web catalog, filled with ready-to-use, industry best-practice business services. IT can learn from retail, how to get there.

Applications Unleashed: The Art Of Application Landscaping

Your expert
Ron Tolido

"Show me your application landscape and I'll tell you about your company."

In an ideal world, the application landscape would be a perfectly accurate reflection of the objectives and governance of an enterprise. It would be highly standardized and industrialized to enable and support core processes. It would be agile, responsive, and insightful at the right places to give an enterprise a differentiating edge.

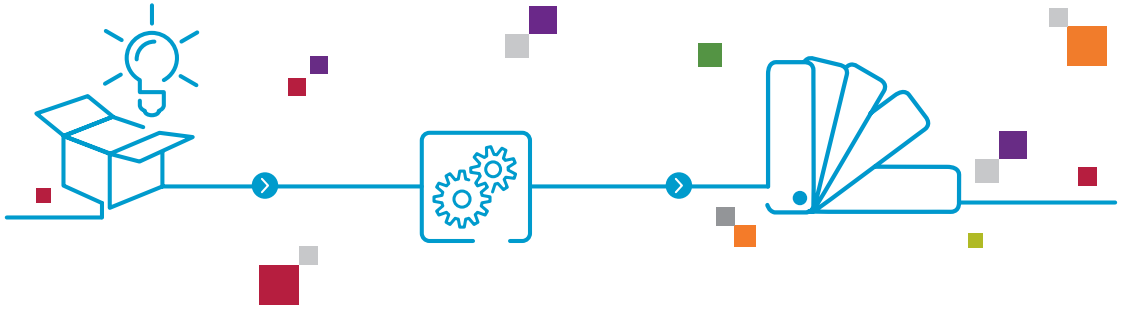
In reality, there's a gap between the needs and ambition of an organization and a limit to which the application portfolio can address it. Keeping the gap as narrow as possible sounds simple enough, but it's a huge task that requires a daring, innovative mindset and determined execution.

In the latest edition of our Application Landscape Report, we conclude that the weight of existing application landscapes is reaching critical mass as disruptive technologies emerge and pressure the business side for more innovation. It's no longer a question of *whether* to rationalize, but rather *when* and *how* to do it.

Enterprises should look for radical measures to simplify and standardize their core applications. The good news: the Cloud is bringing a whole new catalog of Software-as-a-Service (SaaS) solutions. As they typically contain industry best practices, replacing existing — often custom-built — applications is not only cost-effective, reducing complexity, it also brings new value to the enterprise. Thinking 'catalog first' however requires a change in mindset that ripples through the entire enterprise, not just the IT department.

When core application landscapes are unleashed, they not only become a stable foundation for the performance of the enterprise, but also a true catalyst for growth.

ALL IN A CATALOG



Your expert
Ron Tolido

The Cloud brings a brand new generation of Software-as-a-Service (SaaS) solutions. Typically, these solutions are not only cost-effective and feature the latest in user experience, they also contain industry best practices in functionality and sector insights. Enterprises can greatly benefit from these catalogs. For example, they can replace existing solutions with possibly bespoke or highly customized ones. They can quickly add powerful new business functions that the enterprise needs to grow. However, constructing something from a catalog is different from the traditional solution life cycle.

Applications Unleashed

If an organization's application landscape is a reflection of its business, then there are a surprising number of unique organizations in one and the same sector.

Although you would expect striking similarities between processes and the systems that support them, many enterprises will cultivate multiple, high-customized instances of ERP. This makes it risky to upgrade to new versions of the application. In other cases, custom-built software further suggests that their processes and functional requirements are so special that no standard solution can support them. Being 'special' comes with a price however, since the core part of the applications landscape — without differentiating any value — consumes the better part of the IT budget (more in the 2014 edition of our Application Landscape Report).

Many core applications — both custom-built and package-based — are expected to provide a differentiating value to the business. However, they often consume the bulk of available IT budget due to excessive maintenance costs, while the differentiating 'edge' is already found elsewhere around mobile, social, BPM, and Big Data. This is why it's time for a drastic move to good old 'vanilla' that uses out-of-the-box, non-customized versions of standard (Cloud-based) software or by step-by-step rationalization of homegrown applications to leaner, simpler versions that are easier and less costly to maintain.

Now, in the era of Software-as-a-Service (SaaS) we're quickly moving towards catalog-based applications that are essentially *multi-tenant*: used by many different organizations in the same way with certain configuration options. Multi-tenancy drives economies of scale, lower costs — particularly in the capital expenditure area — and a much shorter time to market.

SaaS champions such as Salesforce, NetSuite, and Workday (also, their incumbent competitors such as Oracle, SAP, Microsoft, and IBM) feature quickly growing catalogs of ready-to-use business solutions.

What's arguably even more interesting, are the marketplaces of third-party solutions built on the underlying Cloud platforms. Salesforce's AppExchange catalog only features thousands of different horizontal and vertical applications that not only cover human resources, finance and administration, and ERP, but also industry-specific areas like Utilities, Manufacturing, Retail, and Government.

It takes some time to get used to the new reality of *catalog power.* After all, we don't shop at IKEA expecting to find the exact furniture that we initially envisioned and described in detail, in specification documents. Instead, we browse through the catalog, wander around, and get inspired by the art of the possible. If enterprises realize that the case for catalog-based SaaS solutions is like IKEA (good design, high quality, sharp prices, ready to take with you and use immediately), they should adapt their IT practices accordingly.

They need to appreciate the basic taste of *vanilla* as a highly cost-effective, low-maintenance foundation for both their processes and supporting systems. The next generation of standard, Cloud-based solutions (whether in ERP, CRM, HCM, or any other functional or sector domain) contain proven industry best practices that support many different organizations across the sector. A European investment bank replaced all of its custom-built core investment banking software by a SaaS solution (deployed on the Amazon Web Services Cloud) and as a result, considerably decreased its IT costs and found that they could create and run more agile, more insightful processes than major competitors.

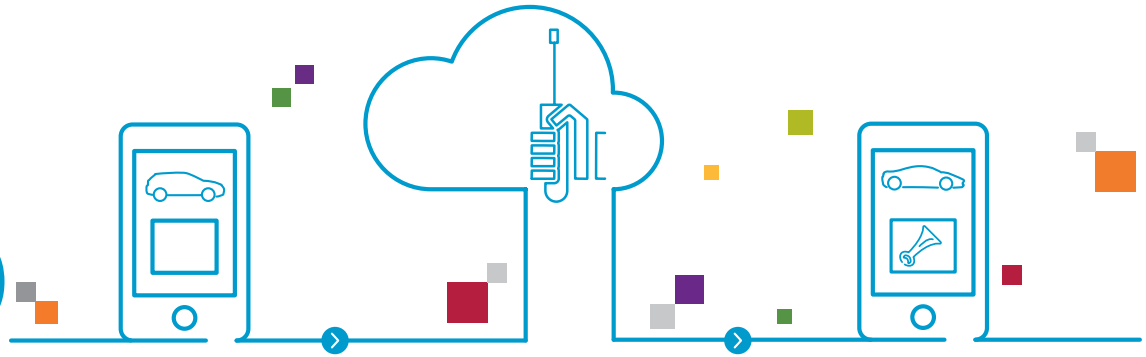
It's up to individual enterprises to take a hard look at their value scenarios and customer journeys (no detailed requirements, remember) to validate how well these industry best practices would work for them. Once done, they should focus on the *deltas* to be adjusted and risks to be mitigated.

This reverses the usual process and makes way for both more radical application rationalization strategies (de-customization, de-instantiation, ripping and replacing of legacy applications) and the quick implementation of next-generation SaaS solutions to drive business growth.

On top of a catalog-based applications landscape there are, of course, many ways to build solutions that allow an organization to innovate, win the hearts of their consumers, achieve operational excellence, and even do business in entirely new ways. These will be lightweight, car and scooter applications that leverage mobility, social, Big Data, BPM, and the Cloud. They may even be 'No App Apps.'

The keys to application landscape modernization are out there. Most of them might be in a catalog.

REBORN IN THE CLOUD



Your expert
Vikrant Karnik

Once organizations have implemented or built their first Cloud applications, they find a powerful platform available to them. Now they need to leverage more of that platform, not only to create additional solutions, but also to renew their existing application landscape. This may be a simple matter of 'Cloud-enabling' legacy applications by providing them with a new front-end and integrating them with the Cloud. However, applications can be completely 'reborn' too, taking full advantage of living in the Cloud.

Many factors are challenging the fear of modernization in the enterprise application space. In some sense, the imperative to be more agile drives IT to question why their apps should change so glacially. The profusion of new development tools (Ruby, Angular.js and the like) combined with methodologies that espouse agility is breaking down barriers in traditional IT risk areas.

The threat of becoming irrelevant to the business is forcing many enterprises to ask "how can my apps be reborn in the Cloud?" This is particularly the case with the advent of a new generation of Software-as-a-Service (Saas) solutions. There are also new, powerful Cloud platforms underneath. A quick look at Salesforce1, Azure, Pivotal, or BlueMix makes it clear that these Cloud platforms provide many different options to renew the applications landscape.

A SaaS Solution? Only the Beginning

What should a CIO do to start delivering on the promise? Start segmenting the applications landscape. Conducting a systematic, facts-driven approach like the Capgemini Cloud Assessment on the portfolio of applications allows the enterprise to categorize and then make informed decisions about the next steps in modernization. With the use of automated tools, the enterprise can start with higher-level application meta-data that identifies the *low hanging fruit* as well as the *high impact applications*.

One can then dig deeper with some topological insight from automated tools that can traverse the application's testing environments and identify dependencies that become critical factors in Cloud suitability and placement decisions.

The last step is identifying the extent of replatforming needed for each of these application segments. This step has to be aligned with the strategic IT direction of the company while keeping the option to align to the exciting new developments in the IT technology arena like software containers.

Following this approach, we see that the typical *destinies* of application renewal look different when the target environment is a Cloud platform. To name the seven most obvious ones:

1. **Replatforming** applications makes use of the highly scalable and cost-effective deployment options of the Cloud to run existing applications more effectively.
2. **Resurrecting** applications consists of adding Cloud-based, possibly mobile, front-ends to applications to augment and improve their functionality and user experience.
3. **Rebuilding** applications leverages the next generation of rapid development and deployment tools to quickly and effectively recreate applications.
4. **Rebonding** applications trusts the considerable integration power of Cloud platforms to eliminate redundant, overlapping, or non-aligned functionality.
5. **Refactoring** applications is about improving, or simply documenting, the structure of applications — a more than welcome by-product of assessing applications for Cloud-based modernization.

6. **Replacing** applications involves taking a good look at the marketplace of Cloud-based applications to find replacements for the existing, typically custom-built applications.
7. **Retiring** applications relies on cost-effective Cloud storage to archive core applications data for possible future use so that the applications themselves can be de-commissioned.

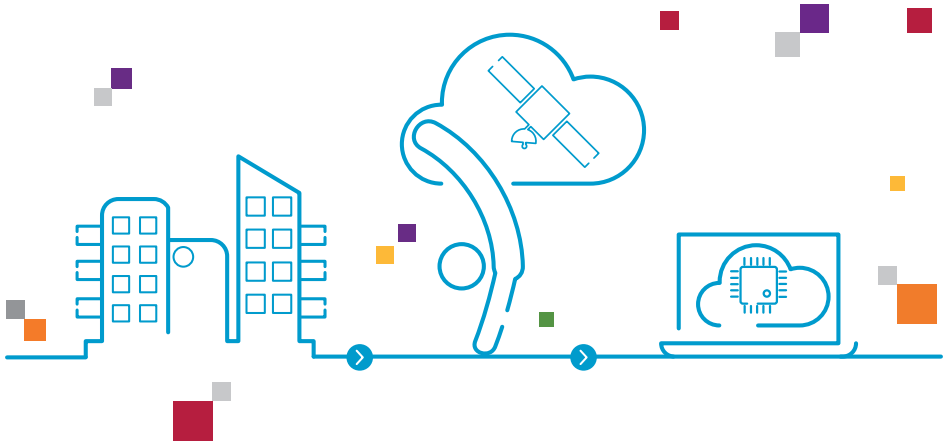
Sounds too Good to be True?

Yes, there are some risk areas to mitigate. The primary risk is interrupting the business services of the enterprise. This should be mitigated by involving business stakeholders from the start of the modernization program. Business is going to benefit the most by the flexibility and agility of the Cloud and if involved properly, it will be an enthusiastic partner in the journey.

Another risk that's often raised is the "futility of trying to stay current" as the technological advance is relentless and innovation seems futile. The question that enterprises need to ask themselves then, is if they can afford to stay still. What's competition doing during that period that can eliminate your future advantage? Actually modernizing the application landscape through a Cloud platform can help leverage the technological advances while focusing on the IT agility needed for enabling business needs.

In conclusion, we could appropriately quote the famous author James Faust who said "a rebirth out of spiritual adversity causes us to become new creatures." Maybe he didn't have modernizing applications in mind, but it sure does embody the opportunity of reimagining apps in the Cloud.

ELASTIC BUSINESS



Your expert
Simon Short

A business is ‘elastic’ when it has the ability to scale at will, to cope with peak demands, and to shrink back afterwards. It can also try new things and explore new areas while remaining connected to the core enterprise. To be truly elastic requires an approach to Cloud solutions that fully incorporates them into their existing, core IT landscape. Being agile and flexible at the edge of business requires integration at the core. The IT department that enables business users to test and learn with new digital services and SaaS solutions at will, while staying connected to their core data and applications, inevitably helps them to become true digital masters.

Fight or Flight?

For large, existing, traditional businesses, the new digital world can seem full of risks and challenges. Big enterprises are undoubtedly slow to change, hindered by long-established processes and operating models that have been built for efficiency — not flexibility. New competitors emerge in no time, born in the Cloud and unconstrained by years of carefully planned capital investment. You only need to see the effect that Amazon and Netflix have had on Main Street brands, or how Hailo and Uber have reshaped the taxi business.

Yet these same risks can provide tremendous opportunities for those that can find a way to harness them. New business models at the edge of an organization are likely to use Cloud services, mobility, and advanced analytics to 'test and learn' new offerings for improved customer interaction. These organizations are the disruptors — not the disrupted. They're the 'elastic businesses'.

Elasticity implies the ability to expand quickly and then shrink back just as fast. For a business, this means rapidly scaling up in response to managing peak demands, such as the launch of a new service, or a holiday promotion, or supporting the fast development of prototypes and new concepts. Central to this fleetness of foot is the ability to harness the Cloud, exploiting new opportunities at a speed, previously unseen.

The real trick is to link and integrate these elastic, agile, 'edge' investments to the core business strategy and a well-governed Digital Transformation. Capgemini's on-going, collaborative research with the MIT Center for Digital Business shows that, over time, the businesses that get this right (the 'digital masters') can be up to 26% more profitable than those that spend just as much on their digital technologies. These 'Fashionistas' crucially fail to coordinate, extend, and integrate across their broader business.

The truly elastic business doesn't respond to change, but leads it. This requires a number of components: a clearly defined digital strategy, governance across the C-Suite, willingness to test and learn (including making mistakes and the courage to shut initiatives down), adoption of 'outside-in' customer-centric thinking, use of data-analytics to support and prove hypotheses, and integration of all new services within existing back-office IT systems. Certainly, businesses shouldn't build new initiatives without knowing how they fit into the current IT landscape and use (and enhance) customer data.

Organizations that establish the right IT principles of adopting new digital services can become truly agile at their 'edges'. They can set up new services quickly and test them out in small (but real) areas, such as in a single store with one customer segment, or with a proportion of website traffic (A/B testing).

Applications Unleashed

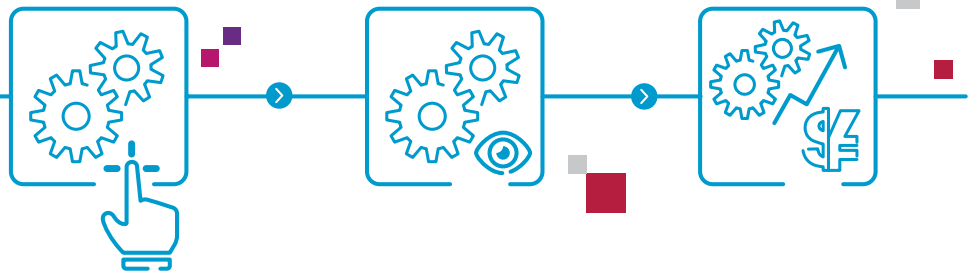
This isn't just a 'nice to have' flexibility — it's absolutely essential for the future integrity of the business. It's all too easy for business users to adopt new SaaS services, or employ niche agencies to write cool mobile apps. But this can lead 'the edge' to becoming a series of islands of innovation. Eventually, the customer sees a disjointed mess, and the concept of a seamless 'omni-channel' is long forgotten.

Our digital research shows that it's not just the new, 'born in the Cloud' start-up organizations that are taking advantage of digital technologies. Organizations in any sector, of any background, of any age see the value. From mining companies to paint manufacturers, digital masters are transforming at the edge, becoming truly elastic, growing, reshaping, and trying new things. A true hothouse of innovation indeed and yet, all carefully managed and controlled.

Regardless of industry, there is no time like the present to take the first step. The question isn't fight or flight, but how to embrace this *elastic opportunity*. Without doubt, the time to act is now.

Part of Capgemini's TechnoVision 2015 update series. **See the overview here**

API ECONOMY



Your expert
Joakim Lindbom

The Cloud opens up a world of opportunities: low-cost, smart, attractive, user-friendly, and dynamic solutions. But most IT departments have a very hard time even trying to keep-up. The clash lies in the inherent and necessary slowness of back-end IT versus the swiftness of the Cloud. Enter the API Economy. Enter times where enterprises realize they cannot predict disruption, customer successes, or ecosystem maturity. May the best API win.

Introduce your APIs to your organization and let them innovate on your services and data. Let them innovate without asking for permission. Who knows, perhaps success may be buried somewhere in your core applications.

Inspiration can be found in open-source communities, recent open-innovation initiatives, and how major Internet corporations have enabled radical growth. The self-organizing structure in the open-source communities couldn't happen with a single master plan. Most of the time, several projects are competing at once.

One of the best ways to attract co-projects in the ecosystem, is to say, "Hey! Here are some cool APIs for you to use. Go play with them and let's see what magic comes out."

In many western countries, state agencies and municipalities have started publishing open data and open APIs, allowing anyone to consume and enrich the data and services to build apps and mash-ups based on data. This has produced some extraordinary apps. A repeated example — train information apps, placing relevant information about actual train status, delays, etc. in the hands of the traveller.

In Sweden, the most relevant and accurate source of this data is no longer the agency providing it, but an app provided by a one-person company. When travelling, the app is faster, more accurate, and richer than the information you can get from the billboards on train platforms.

Another example of extensive API usage is Netflix, which today deploys new versions of their services 100+ times per day. This certainly couldn't happen if Netflix was one tightly coupled set of systems, but with the help of DevOps and using APIs to isolate the components from each other in most ways, every delivery team is free to adopt, improve, and expand their service without having to interact with anyone outside the delivery team.

The API is the contract regulating the usage of the service, and as long as the team observes that contract, they're only limited by their imagination and skill. Compare this with major corporations and authorities that would be hard-pressed to deliver more than two new versions every year. These organizations would be helped with an introduction to an API Economy and a slew of fractal organizational thinking.

To a large extent, the tools for the API Economy are already present in known SOA suites, with the addition of API management tools like WSO2, Apigee, and Intel's Mashery. APIs are valuable assets, and you need to treat them as any other product or service that contains value.

The main differentiator from SOA comes from a forced outside-in perspective. You need to think about what a presumed consumer could need and how that consumer would like to see your service. How can you facilitate and ease the usage of your service? How can you improve on an existing ecosystem and win over app developers, internal or external? And once there, how can you make sure your service improves, evolves, and adapts to the needs you cannot foresee today? It's a Darwinistic game, where adaptability and staying mean and lean is a better strategy than becoming omni-capable and bloated.

The main effect is one of going from the presumed, predictable, and plannable integration-driven efforts. Shifting the mindset to creating serendipity will cut the time dependencies within your system estate. Other departments can now innovate on your data and your services, without having told you one year ago what they would do.

Applications Unleashed

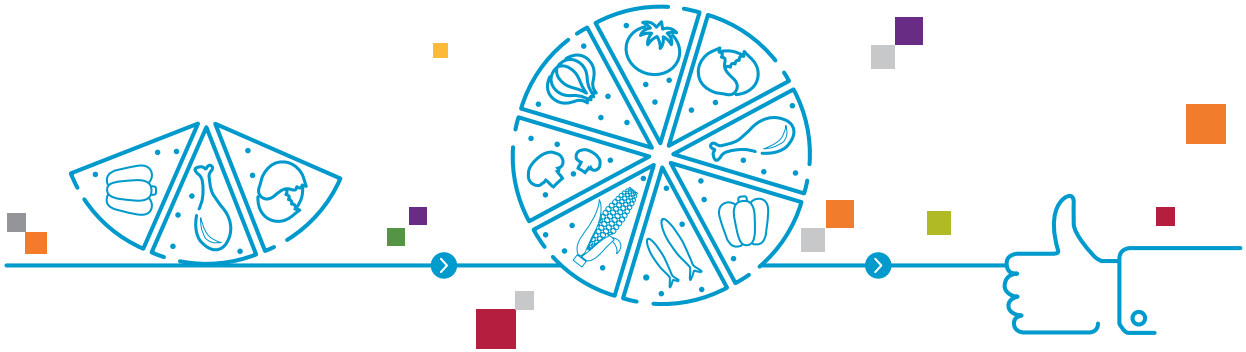
Internal start-ups/labs can drive in the speed of the market, rather than in the speed of the slowest back-end system; much inspired by Jack Welch's famous words, "If the rate of change on the outside exceeds the rate of change on the inside, the end is near."

Salesforce provides a striking example of this API-enablement. More than 70% of the daily traffic to its core applications is based on API-usage rather than the browser-interface. Vendors, service partners, and customers have been able to build apps, mash-ups, and services without having to know too much about the innards of the applications. Salesforce can evolve their systems without knowing how their customers are using them.

There are also good examples of apps mixing different cab-booking services, e.g. using the Uber booking API to get price quotations and GraphHopper to find the shortest route, based on crowdsourced map data from OpenStreetMaps. Or, if you do transportation, pick-up and delivery, or field-service work, using the APIs for Optimoroute with multi-stop route optimization could be the easiest solution to the classical traveling-salesman dilemma.

The application is the API. The interfaces to your core applications are the key to both liberating your existing IT estate and enabling its innovation and growth. May the best API win!

NO APP APPS



Your expert
Ron Tolido

With core applications becoming ‘vanilla’ again, the differentiating edge of IT solutions will come from the next generation of applications that are not really applications anymore. Quickly created by gluing reusable, catalog-based IT services together and building on APIs, they leverage visual, model-driven platforms that work from business-process descriptions to generate code. They use self-service BI, BPM, and business rule tools to create solutions in close proximity to the business. They apply mobility frameworks to create new interfaces without diving into the software underneath. Yes, the future app might still be an app, but not as we know it.

Let's assume you've done all the things that transform your application landscape into a set of unleashed applications: you've adopted industry best practices (building from the catalog) and eliminated excess instances, customization, and bespoke software; you rationalized and renewed your application portfolio, benefiting from new Cloud platforms; you've applied some next-generation SaaS solutions, creating a more elastic business.

Now, it's time for the cars and scooters: solutions that are created and deployed in the nearest proximity to the business and have a fast life cycle. After all, being just as standardized and rationalized as your peers in the sector is a basic necessity — a *hygiene factor* — but it will not provide you with the differentiating qualities to stand out in the market.

For that, of course, your organization needs to establish where it's different, where it's special, and where it wants to apply technology to be *digitally relevant and intense*. Then, you want to deploy the right processes, activities, and solutions as close as possible to where it really matters: the business. And — most important — you want to have the agility to quickly implement and improve your solutions, over and over again.

At this point in time, we're already aware that detailed requirements will not bring us where we need to be: too much time needed, too much friction between demand and supply sides, too much disappointment as a result. You probably also don't want to build all those car and scooter solutions using advanced, yet complex programming languages like C# or Java. They require highly trained software engineers, who are not necessarily suitable, nor interested in working in the middle of the business, even when agile approaches such as Scrum and DevOps are used to bridge the gap between business and IT and get optimized results within a given timeframe.

The future of a certain category of applications is existential. They might not be applications at all, at least not as we know them now. They're built with tools and platforms that don't require classical programming skills. It might be, at least to some extent, that business people use the tools themselves to create their solutions or — quite likely as well — business and IT working closely together, preferably at the same place.

Need some Examples?

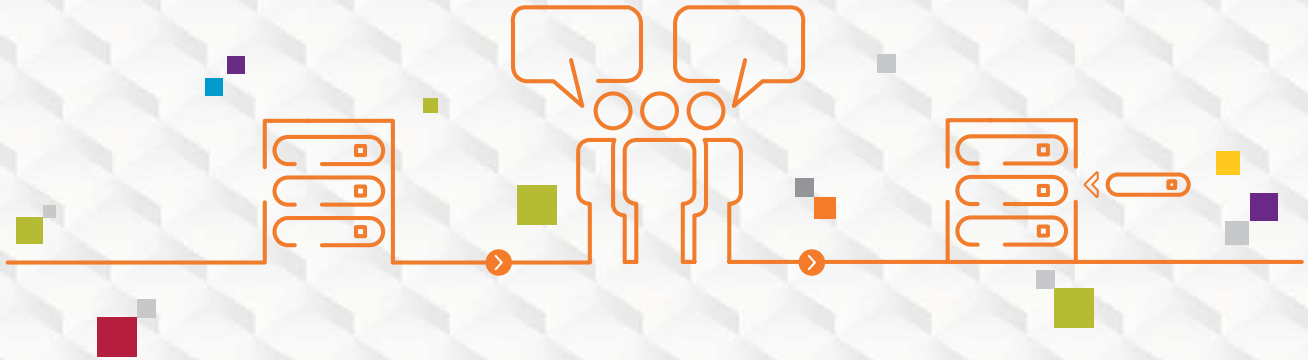
Platforms like Mendix, OutSystems, Progress, and Magic provide easy-to-use tools to create visual business models that are turned into attractive, executable applications without ever seeing a single line of code. Salesforce's brand new Lightning tools provide many different ways to create Cloud-based and mobile applications using visual UI builders and 'point-and-click app logic' through formulas, workflow rules, approval processes, and visual workflow.

Business process platforms such as those from Pega, IBM, and Oracle only require you to insert natural language business rules to create solutions that once relied on complex programming.

Compelling mobile applications can quickly be developed with platforms such as the Kony development Cloud, serving multiple devices and mostly just requiring drag-and-drop actions and maybe a bit of Javascript coding. Even blogging platforms such as WordPress provide development capabilities that utilize templates and 'plug-in' scripts to create serious, compelling Internet applications.

When it comes to business agility, the best app might be no app. Hold that thought.

Thriving On Data: From Buzzwords To Real Business Value



Your expert
Manuel Sevilla

When data is turned into insight – provided at the point of action – it becomes a true business value. Organizations can benefit from next-generation 'Big Data' technologies by reshaping their existing data landscape into a more cost-effective, yet increasingly agile foundation for business. They thus enable themselves to deal with the flood of data that will come from connected people and things.

But there's more: predictive analytics – delivered in real time – can substantially redefine business models. And there's no end to the disruptive potential of cognitive computing and deep machine-learning. Organizations that manage to create an 'Insight Everywhere' culture will truly thrive on data.

Big Data is huge for many organizations. Potentially, that is. Our latest research by Capgemini Consulting shows most enterprises put better insights from data at the very top of their digital priority list. It's just that it turns out to be quite difficult to get *beyond* the proof of concept and actually start monetizing the promise.

Two years ago, Big Data was the much-hyped expression analysts, consultants, and customers were still trying to define. Nowadays, the Internet of Things, *m-Health,* online retail, energy consumption, and connected cars all rely on Big Data as a key component to make the promise real. After having done many proofs of concepts to explore the opportunities, enterprise momentum is now moving from analytics to production usage and daily business impact.

Disruption is looming around the corner as shown in our most recent report. The majority of the companies interviewed believe that the *new data landscape* will thoroughly shake up business as we know it. New entrants will use data to create brilliant, intelligent products and services and with equally superior delivery.

Luckily, enterprises still have the option to be at the positive end of disruption. As we stipulate elsewhere, it's not all about ending up in the *Valley Of Doom*. By embracing data – living and breathing it – enterprises can take the lead to become truly *insightful*, making better use of the assets they possess and thus outsmarting competition.

More agility, less infrastructural constraints, and a tight relationship between business and IT are at the heart of making better and new businesses with data. It's at the very heart of Digital Transformation and what Thriving On Data is all about.

MY **DATA** IS **Bigger** THAN YOURS

Your expert
Anne-Laure Thieullent

What if there was no limit to what data could be stored, no structure imposed, and no filter on what's presented and analyzed? With 'Big Data' solutions becoming more mature and enterprise-ready, organizations are now increasingly – and with some urgency – looking at how to actually leverage this incredible potential. Data is already so much more than a mere corporate asset. New business models and revenue streams emerge, created by monetizing data with business partners and customers.

There are many opportunities to simply improve the existing data estate as well, saving costs and adding agility. Proofs of concepts have been widely successful. The challenge is to transform all this data into insight at the point of action, delivering real business value.

The era of technology as a limiting factor in the performance of data storage, access, and analysis is over. Over decades we've seen business users frustrated by sampled or limited datasets and *spaghetti architecture* landscapes, where data sits in silos, but is replicated in each system where needed for business questions.

The wave of Big Data technologies, platforms (including Hadoop), and the analytics solutions now available, support the widest variety of workloads, finally realizing the promise *of store once, use many.* Multiple-access and analytical frameworks – increasingly powerful and simple to use – run on top of this data foundation to *democratize* the access to data. It utilizes SQL-based access layers (Impala, Hive, Spark SQL, Hawq, Drill, to name a few), search capabilities, and vendor-specific connectors. Yes, it's still Big Data. But it's *Easy Access* now.

Looking at combining 'strategic workloads' (trends or pattern-detection over a long history of data) with more 'tactical workloads' (continuously stream data, identify in real-time specific events and react accordingly) is a key component of Big Data-style architectures. As *big* as these foundational platforms may become, integrating the ability to handle streaming data 'pipelines' from sensors, network probes, transactions, and real-time analytics on day one will tremendously improve the value enterprises create. As enterprises predict and prescribe how their company, marketing team, store manager, and sales representatives should react *right away*, they make a compelling difference – acting when and how it matters most.

With the agility brought by these technologies, organizations need to reposition the way they manage their data and the projects revolving around them. New governance models emerge where agile development with integrated teams between business and IT work together.

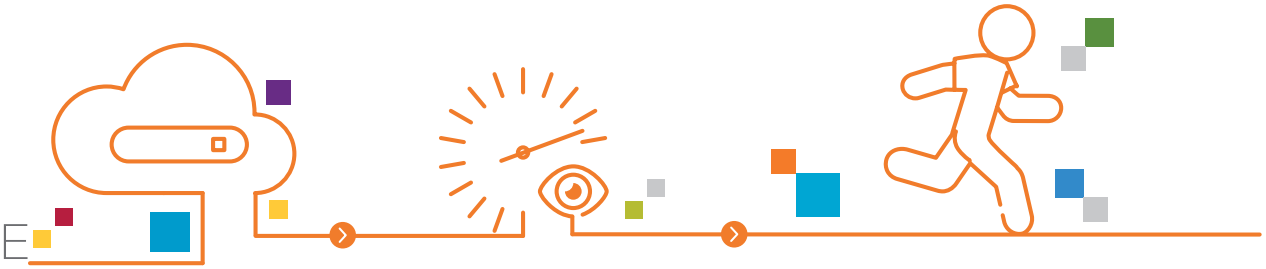
Big Data brings a new opportunity to break away from design processes. Business teams need to justify the value of adding new datasets to a BI system before being able to manipulate and evaluate the new data. Too many projects stop or remain unanswered because of an unjustifiable or unknown value. As a result, business opportunities are lost.

Leveraging a Big Data platform, through an exploration lab (and team), is key. It will allow the testing of new data sets, expanding its reach from *just* its own data to external data (open data, third-party data), while testing out entirely new analytical models. This will lead enterprises to start thinking about how Bigger Data allows them to create new services for customers, new business models, and unexpected and unexplored data-driven partnerships.

As mind-boggling as the growth opportunities brought by Big Data can be, enterprises don't always need deep-science or radical disruptive ideas to get in the game. It can be as simple as repositioning the problems they're already working on and understanding how Big Data changes perspectives. Why not simply start by addressing the current state of the existing BI landscape (for example through an industrialized Data Optimization approach)? Look at the problems the business is encountering and the questions that are still unresolved and see how the Big Data lens might change things. Then set up the first new governance processes and start exploring and experimenting with data.

Sooner than you think, you might be able to tell your competitors that *Your Data is Bigger Than Theirs*. It actually means your business is doing better. And that's the real big thing.

REAL Real TIME



Your expert
Jorgen Heizenberg

It's true after all: size doesn't matter. Big Data really is about the ability to analyze and act in real time, using data from sensors, transactions, or interactions from inside as well as outside the organization. This 'Fast Data' can be used to solve tougher business problems, create more competitive advantage, and make more informed decisions in a tightly connected world. With this comes the opportunity to create ultra-fast insights, often within a single CPU cycle, used by businesses or even automatically. If there's no longer a need to wait, the opportunities for radical business reinvention are limitless.

Thriving on Data

Werner Heisenberg was a German physicist and one of the key creators of quantum mechanics. In 1927 he published his *uncertainty principle,* for which he is best known. It states: "It is impossible to determine accurately both the position and the velocity of a particle at the same instant." Position is the identification of the relative location, in other words: *where you are*. Velocity is the speed and direction, in other words: *where you're going*. It's rumored that Heisenberg went for a drive one day and got stopped by a traffic cop for speeding. The cop asked, "Do you know how fast you were going?" and Heisenberg replied, "No, but I know where I am."

The same applies for many organizations today. They know where they are (or have been), but they often don't know where they're going.

The main reason? Their data is at rest even when it's 'Big.' Think mostly inactive data stored physically in any digital form – for example a database or a data warehouse. It may also be used primarily for historic reporting or analysis on mostly internal data by the IT department. Although the quality is high (data warehouses are often associated with a high level of superiority and a single version of the truth), the time to market is often low (batch-oriented overnight architectures) and the value is actually relatively low.

To be truly successful, organizations must transform from *hindsight analysts to foresight action takers*. This implies that data is no longer at rest, but in motion or even in use. It should flow in real time through the organization, changing business outcomes on the fly.

Data streaming technology from vendors like SAP Event Stream Processor or Informatica VIBE data stream allows enterprises to collect and deliver small data packages accumulating into one large 'Data Lake'. Softwares like IBM Infosphere streams or the SAS Event Stream Processing Engine, bring complex analytics to operational data, creating faster insights and interactive visualizations to support business decisions.

Big Data created a paradigm shift in the way we look at decision making today. Traditionally, structured data from internal systems like ERP had been the main source for this. Now unstructured data comes from sensors in machines, planes, trains, automobiles, or even the fridge at home. It allows companies to optimize their client's travel or create a predictive shopping list, adding to the amount of data available. This is also where external data from websites or social media can tell enterprises about its own performance. Not with facts or dimensions from the IT data warehouse, but with engagement on social channels by customers. We live in a time where Facebook can predict if someone is about to cheat or commit suicide, where Google can predict a flu outbreak, retailers can calculate that your daughter is pregnant.

Big Data is not only about volume, as the name suggests. Volume is still data at rest – storing massive amounts against lower cost, for example in a Hadoop environment like Cloudera or Pivotal. Big Data is also about where you are (position) and where you're going (velocity) with *speed as the deciding factor*. Research (for example our latest report 'Big & Fast Data: The Rise Of Insight-driven Business') shows that C-level executives are convinced that value from data can be found in real time. In other words, *Fast Data* (insight) is even more valuable than mere *Big Data*.

Thriving on Data

Fast Data has been made possible by advances in technology like in-memory or real-time replications allowing users to quickly find usable insights from inside as well as outside their own organization. New insights are only one CPU cycle away. The *in-memory* SAP HANA platform or IBM DB2 BLU support such an environment. Companies like Teradata support the need for speed with their Massive Parallel Processing Database appliances.

In order to be competitive in increasingly complex business environments, organizations need to predict future outcomes like customer behavior. This has to be done based on all the available data, historic and current. It's important to evaluate the data – through advanced analytics – but even more crucial to act before an event takes place.

A credit card transaction of a European citizen in South America shows possible fraudulent behavior. Do we block the card right away?

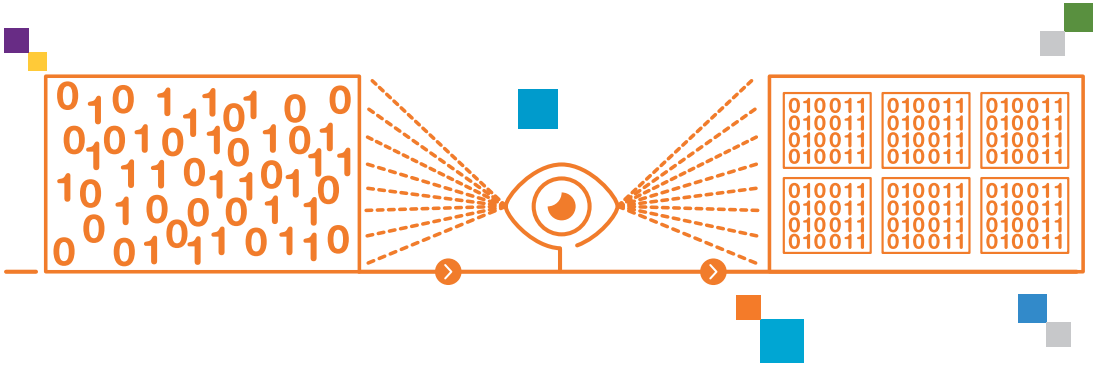
An online retail competitor changes the pricing for their three most popular products. Do we change our pricing policy in real time?

A railroad switch suddenly reports increasing energy consumption. Do we proactively perform asset maintenance?

When 'real time' becomes real – with no more need for waiting – the event and the action become one. And not necessarily in that order. It's not unlike that famous movie Minority Report, in which police forces use data to predict where a crime will take place and send officers to the scene proactively. Talk about new business models.

Say my name, *Big Data*: it's Fast Data.

NOW YOU SEE ME



Your expert
Mamatha Upadhyaya

So much data, so little time. The more we create, the harder it is to deliver real value against the changing needs of both the organization and the marketplace. With time, the context of data often changes. To understand and manage this change, we must understand our business and our data better. Increasingly, this isn't just the realm of data-science, but that of digital visualization. When we combine state-of-the-art technology with sound business strategy and orchestrate the right and left sides of our brain, we truly start to see. Our visual story becomes insight, then action, and finally business value.

Thriving on Data

The main issue with data is that it's simply not accessible to everyday business people as it's difficult to understand, adapt, and exploit as a result of its increasing isolation from 'business as usual' activities. To bridge this widening context gap, we need to embrace data visualization and embed its benefits into the operational fabric of our business. By doing this we can deliver intelligence, which is 'to the point', insulated from underlying IT complexity, instantly consumable at the point of action, and instinctive in its application.

This is when real value is created from data.

Acquisition, marshaling, and increasingly pre-analysis of data is now a commodity. 'Big Data' technology, Cloud foundries, and the emerging field of cognitive computing are accelerating real-time data insight as vendor-technologies exceed the mainstream tipping point. Despite this, typical Big Data approaches are wedded to corporate data complexity and divorced from business reality.

The journey to enlightenment remains shrouded behind a veil of PhD statisticians and CXO command-and-control mentality. What's more, business users are dissatisfied due to enterprise inability to deliver meaningful and adaptive insight. Maybe the *data artist* is the data relationship-counselor that can bring business and IT together using common language.

To improve your corporate data relationship, think infographics, accessible visualization, interactive presentation technology, usable metrics, and wearable devices as crucial elements of your evolving digital palette.

If we believe that a 'picture paints a thousand words' and that data science and data art are equal partners in Big Data success, what are the next steps?

1. Expand your data toolkit with infographics and visualization tools

From infogr.am to easel.ly, through piktochart to visual.ly and quid, we need to progressively simplify accessible visual metaphor technology. Vendors like Tableau or SAS with their Visual Analytics tools are just two mainstream examples of tools that enable business users to become data artists. Make data an 'Object Of Desire' and it's more readily consumed.

2. Adopt non-linear, intelligent presentation approaches

Armed with a 'Dan Roam' mentality and your printed linear slide decks consigned to the waste bin, try out Cloud-based visual presentation technologies such as Prezi, Haiku Deck, and Slideshare to consolidate your ideas using visual, data-driven, dynamic, and non-linear approaches.

3. Embrace usable metrics

Take progressive action to ensure your reports and visualizations focus on a small, but perfectly balanced set of metrics through which you can easily monitor the development of your business accurately and, of course, incrementally.

4. Get physical to accelerate context

Google Glass, Microsoft Band, Apple Watch, Moto 360, and Oculus Rift are the early birds in the technology migration to 'surroundable data context'. These technologies have the potential to inject meaningful personalization at each point of business and channel interaction.

In addition, as we 'swear by wearables', development frameworks such as Android Wear live and breathe visual thinking. With only a few square inches of screen real estate, we have to make the information count and therefore put 'actionable context' before detailed narrative.

5. See the bigger picture

When looking at the overarching TechnoVision framework, we begin to see that 'Thriving On Data' is a collaboration across all digital building blocks. It cannot stand alone. The reverse is also true as we can only deliver actionable data if we truly embrace the ethos of 'Process on the Fly' and, we can only easily visualize a complex story if we adopt a 'You Experience' and mobile design philosophy in parallel.

To deliver data context we have to consider our business transactions as visual stories. While data science may provide the corporate *data pump*, data visualization delivers the organizational *smart-meter*, ensuring the right information is delivered efficiently into the hands of right person in the right format at the right time with 'a la mode' perspective.

Still looking for inspiration? Consider leading-edge examples of digital dashboards like the SAP-Hana powered McLaren Formula 1 racing dashboard, digitally create your Youniverse personality, and understand the pulse of Amsterdam in these stunning examples. Then, expose your inner digital-Van Gogh by consuming the perfection of simple visual design on the Information is Beautiful blog to add color to your evolving data artist palette.

If we have continuous and actionable insight, we'll not only understand the situation, we'll see the next-best course of action immediately. This could be a real epiphany as our data speaks in a language we can understand, morphs as our needs dictate, and finally becomes the ultimate driver to our ongoing Digital Transformation journey.

Value from data: not an illusion. Real.

DATA APART TOGETHER

Your expert
Steve Jones

What if there wasn't a single source of truth in corporate data after all? Many enterprises are now adapting to a 'federated' business reality in which many different sources of data exist, with different views on how to use this data. In order to deal with this situation, and ultimately thrive on it, this requires the smart use of the next generation of Master Data Management and Business Process Management tools, combined with all the goodness that comes from the Big Data technologies wave.

And there's more: the matter of corporate governance in which collaboration is critical to bringing the right data together. Thus, data that is apart together becomes part of a powerful digital platform that enables the enterprise to go to any current or future direction through data.

Thriving on Data

As Capgemini's research with MIT Sloan, the Digital Advantage, found, companies that become digital, outperform their peers. Most tellingly it was companies that took the *conservative* route to digitization that delivered the most managed route towards becoming a Digital Enterprise. The challenge for any organization looking to become digital is to leverage *all* of its data and to enable the business to combine it. The 'Fashionista' approach is to opportunistically look towards technology silos for point solutions. The 'Conservative' approach is to look towards governance and a consistent way for all the business to combine the information to their individual needs.

What about leveraging some good old conservatism while becoming more agile and innovative at the same time?

This view on information underpins the Business Data Lake which Capgemini co-innovated with Pivotal. Data Apart Together is not simply about how you combine data; it's about how you enable different business units to combine data in different ways. This is where governance, in particular MDM and RDM, deliver huge benefits. The role of governance here is not to constrain the business by forcing a single view, but instead to concentrate on how a business can *collaborate* around information. This view on governance is essential when thinking about how business users actually leverage information.

For many years there's been an approach of focusing on the data *schema* to create a single and consistent view for every part of a company. The problem is that this doesn't reflect how people actually use information in their jobs. Stakeholders look to create *personal* views that reflect the individual challenges that they, and their teams, face. Thus the Marketing lead for an airline looks towards the customers as the center of their view, while the maintenance department looks for aircraft information. To bring disparate data sources together for the business is about enabling them to create the *right* insight for their problems, or to put it another way, *insight at the point of action*.

Governance needs to reduce focus on *schemas* and *data quality,* and build toward how data sets can be combined and therefore, on the identifiers that can be used to link those data sets consistently. Data quality becomes a *side effect* of governance rather than the goal. This approach is essential when looking at Big Data solutions.

It's ridiculous to think you can possibly create a single schema that includes all of the internal and external data that a company uses. Information from Facebook and other social media feeds is ever changing, information available from open-government sources is continually added to, and unstructured information like email and attachments defy any sort of traditional approach.

In the Business Data Lake we've concentrated on governance from a *business perspective* not from a technical IT schema approach. This approach focuses on enabling collaboration and allowing the business to combine the various data sets within the Lake to create their own local views, and from there to see where more governance and data quality is required – rather than creating a central plan, which turns out to be wrong.

This focus on identification and cross-referencing means both transactional systems, as well as post-transactional analytics, can leverage the full range of organizational information in a managed approach that aligns with the business model and value. It thus delivers on the promise of digitization and delivers benefits earlier than technology-centric approaches.

'Data Apart Together' is a key trend for businesses and IT to recognize how the market has changed. It's about creating a platform that helps the *business* bring fragmented data together for its *local* purposes, not how IT imposes a single view on information that constrains the agility of the business.

COGNITO ERGO SUM

Your expert
Manuel Sevilla

The emergence of ‘cognitive computing’ implies a new era of technology and human collaboration. Rather than following pre-defined rules, Artificial Intelligence moves one step further as it adapts ‘fuzzy’ human ways of absorbing and interpreting information. It lacks the friction between the individual seeking assistance and the technology providing it. Faster, more accurate, and better decisions via ‘self-learning’ robotic software means leaner operations, better insights, and more business value. But don’t worry: a machine can only be so human, can’t it?

Is AI Really Elementary, My Dear Watson?

Ray Kurzweil famously predicted that by 2029, computers would pass the 'Turing Test' – the moment at which intelligent machine behavior would be indistinguishable from that of a human. This prediction came *before* the arrival of the fax machine. He also predicted that by 2045, computers will be a billion times more powerful than all of the human brains on earth. Now that's deep learning, isn't it?

Systems like IBM's Watson are on the threshold of commercially viable processing, and indeed self-learning, of semantic language. Whilst their progression has not been stellar thus far, their ability to digest unstructured information at millions of times the speed of human cognition, coupled with the emerging field of cognitive and quantum computing, is narrowing the *context gap* at a faster rate than ever before.

We stand at a tipping point, comparable with the Industrial Age. The next evolution in computing has the potential to create machines that will know the answer to our questions before we ask them. This will be based on an insatiable ability to process enormous amounts of human and machine-generated log data in its raw and unstructured form to analytically derive context, meaning, and perhaps most importantly of all, dynamic underlying *relationships*.

A large proportion of our effort in the current digital drive to business agility – and indeed consumer and market responsiveness – lies in the 'drowning' field of integration. This torrent of interface logic attempts to structure relationships that change too frequently. They're simply 'unstructurable'.

What if in the future we left the analysis and interpretation of key data events, inside and outside our organizations, in the virtual hands of cognitive computers powered by the Cloud?

Instead of today's CIO focusing on the 'obsessive integration syndrome' they would drive 'federated intelligence'. IT would admit defeat in the fight for corporate control and data structure, subcontracting to regulated machines that enhance core data against internal learning algorithms to adapt to the changing needs of the customer, employee, shareholder, and regulator.

In 2011, IBM's Watson performed as a contestant on the US game show 'Jeopardy' and won. What's astounding is that its exploits weren't coded by human engineers, but self-taught by reading Wikipedia – *all of it*.

This cognitive reasoning underpinned by semantic computing (or natural language processing) has the potential to automate patient diagnosis, research and development activities, product ideation cycles, financial and risk-decisioning, and supply-chain optimization to name, but a few potential areas. It's even powering 'personality profiling' through Big Data and psychology.

The future for doctors, pharmacists, actuaries, quants, product designers, data scientists, auditors, recruiters, or pilots will be very different than it is, today. They will be pushed 'higher up the information supply-chain' to interpret, govern, and create the change rather than only participating in the journey.

A GE turbine alone generates more event data in one day than the entire global Twitter feed. This 'data dark matter' cannot be easily interpreted using

current structured and highly manual data-processing techniques, plus the impact of the expanding *sharing economy* is pushing future data ownership from the CEO back to the consumer.

A future emerges, in which, machines facilitate strategic, economic, and political decisions to accelerate a global process of creation, ideation, and rationalization. They will commoditize the acquisition, marshaling, and interpretation of global thoughts, actions, events, and sentiment from socially enabled people, machines, and sensors to enrich a globally accessible repository of open data.

So, the most 'human' of decisions in future may not require a pulse at all.

Early cognitive, deep learning and natural language capabilities have arrived. Our own 'personal data Sherlock' may await us in emerging technologies such as:

1. Open Source - Apache Mahout, Caffe, Deep Learning 4J, and Goggle's Word2Vec
2. Commercial products and services - Declara, Ersatz, Intelligent Artifacts, Numenta, Saffron, and Watson
3. API AI stores - AlchemyAPI, Cognitive Scale, IBM, Pivotal, 0xdata, and Vicarious

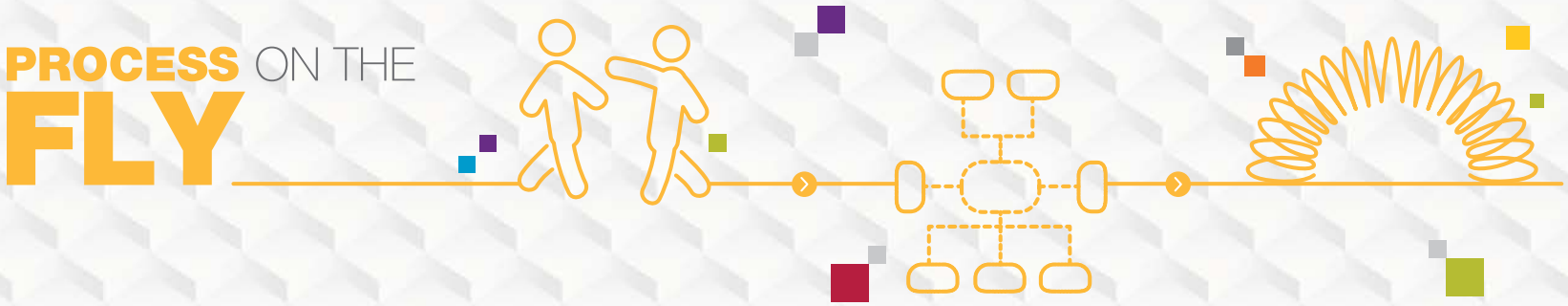
Future IT service models will drive Cloud-based adoption of increasingly cognitive 'pick & mix' application stores and APIs that will be combined to filter, analyze, and deliver intelligent semantic context against global data events in a form that makes sense to both the enterprise brand and employees.

We can now rent brainpower by the hour and be in with the in-crowd. After all, why bother to continually integrate your disparate systems against this torrent of global event data when a *cognitive* 'Enterprise Relationship Bus' could summarize your daily status against potential risks and opportunities in direct linkage to your customers, products, and services?

There are tangible real-world examples in place today from cognitive cooking to personal diet advice, from improved heart disease diagnosis to reducing global crisis response times, and from biodiversity and conservation to faster recruitment screening. The possibilities are endless.

Conscious technology, even more conscious enterprises: it may make the difference between just being there and being a true digital existence.

Process on the Fly: In Search of Agility and Responsiveness



Your expert
Lee Beardmore

While the trends and drivers of 'Thriving on Data' make enterprises smarter and more insightful, the building blocks of 'Process on the Fly' make them agile and more responsive. Together, they create the 'digital spine' that connects enterprises to the unpredictability of the outside world. As there are many different flavors, organizations can apply one and the same set of technology drivers to support stable, predictable workflows and ad hoc configurable responses to spontaneous events.

It may be the biggest cliché of them all, but to flourish in the rapidly moving digital world, organizations need to effectively adapt to change. The trends and drivers of *Process on the Fly* combine process, rules, and event-management technology with custom-software development to provide a platform that enables new ways of optimized working, *without* constraint and *with* control.

Leading businesses are pushing organizational boundaries and extending the reach of their processes. There is a new yearning for freedom, but that doesn't mean it's free for all. There are numerous controls, regulations, and laws to comply with, and auditors to satisfy. This friction between freedom and control is one of the most interesting areas addressed by *Process on the Fly*.

For control, there must be a 'mega' process foundation that drives compliance. These are the *watchdog* capabilities that guarantee the integrity of the organization.

For freedom, *dynamic case management* provides an element of non-determinism, where input criteria and environmental characteristics drive alternate routes through any business process. These work in harmony with 'micro' process applications that enable agility, they're are quick to build and quick to change — even *on the fly.*

When those are combined, the entire enterprise user ecosystem — employees, partners, and customers alike — operates in a way that's appropriate to their circumstances. When coupled with the building blocks of *Thriving on Data*, this heady mix of technology delivers what business expects: immediate response to real-time insights and rapid evolution to match a volatile environment.

SHADES OF PROCESS

Your expert
Ard Jan Vethman

State-of-the-art Business Process Management tools make it possible to support, define, run, and manage processes in many different ways. Forget about carving process definitions in stone. Nowadays, depending on specific business needs, Business Process Management provides at least 50 different flavors of agility, ranging from the classic pre-defined, workflow-styled process integration via document-based interaction, to dynamic rules and policy-based process choreography. There are many different shades to consider during an enterprise's journey towards increased responsiveness and flexibility.

Process on the Fly

What if we were to look at the processes within our organization the way we look at Google Maps? Could we identify the different shades of process immediately? We all know the benefits of a good navigation system, using up-to-date roadmaps and real-time traffic information (including your own position on that map). The way we travel by car now is so much more advanced than the state of transport was, only two centuries ago.

But how well do we know the traffic that goes on in our own organization? Just think what it would mean to have the 'satnav-level' of insight on your business processes as well.

Let's stay with analogies for a while and have a good look at our From Train to Scooter 'Design for Digital' building block: it differentiates the IT landscape in terms of agility and associated solution life cycles. 'Train' solutions are the most stable and predictable, followed by the 'bus', 'car', and finally 'scooter' ones.

It works very well to understand our different *shades of process*. A train network and schedule is based on standardized routes where the time between stations is known to the minute. The associated processes are therefore typically *straight-through processes* with few exceptions. The bus network obviously has many more stops and potential delays and detours, requiring more flexible options in the process.

Cars can follow many routes (and carry individual passengers) at all sorts of different speeds. As mentioned, this mode of transport has been impacted the most by the ability to use real-time information (maps and traffic information) to optimize the route. And finally scooters: highly individual, ultra-flexible means of transport that may allow taking unpredictable, *on the fly* shortcuts that weren't even foreseen in the street design.

If we look at the portfolio of products and services of leading process management suppliers, such as Pega, IBM, Oracle, SAP, and Salesforce, we see that they typically support these different categories of processes. They help to define and model the processes, run them through automated support, and finally monitor, manage and, improve them based on collected process metrics.

Arming enterprises with so many different ways to deal with processes provides them with new power to reposition and optimize the data they exchange, and the way they're supported by IT solutions. Where data technologies make enterprises smarter and more insightful, process technologies help to act on insights and ultimately be more responsive and agile. It makes *Thriving on Data* and *Process on the Fly* intimately entwined.

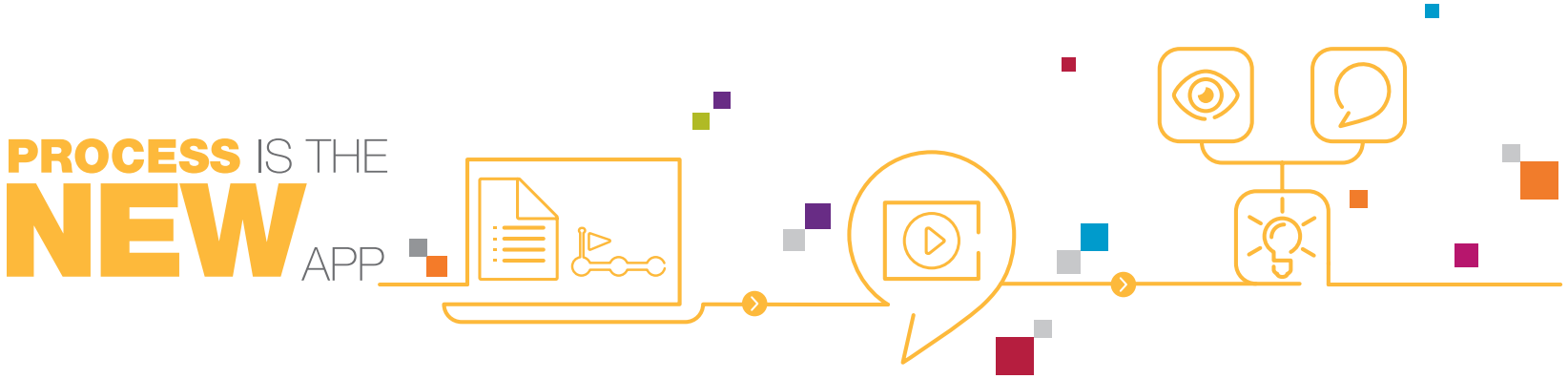
Process on the Fly

Process Mining can come in handy too. It's a set of algorithms that analyzes process event data and constructs the network of possible routes and traffic. This way, you discover how data actually travels through the processes within your organization (rather than how you thought you designed it). One of the typical discoveries is that there are many more 'scooters' moving around than you expected, some using smart shortcuts, while others use risky non-compliant ones. Once you know this, you can either try to get people back into more formalized, better structured processes, or you can try equipping them with better information, so that they achieve their objectives safely and effectively.

So, start building your process network more interactively — possibly using process mining — and discover all the different shades of process and the associated optimal applications life cycle within the enterprise. Use this information — and the right portfolio of BPM and business rules management tools — to improve the enterprise processes, over and over again.

A seductive perspective indeed!

Process on the Fly



Your expert
Léon Smiers

The next generation of Business Process Management and Business Rules Management Tools isn't powerful enough to be seen as the successor to custom-built applications. Being able to define detailed process flows and decision trees enables both business and IT to create powerful, differentiating solutions that would have required extensive custom coding in the past. Now, much of the definition can be done on the fly, using visual models and (semi) natural language in the nearest proximity to the business.

Process on the Fly

Over the years, ERP systems have been extensively customized to address organization-specific requirements. This arguably leads to tailored support for the business, but at the same time, involves mounting costs for maintenance, high dependency on the personnel involved in the customization, long timelines to deliver change, and increased risks in upgrading the ERP system. The situation is certainly not better with bespoke software — often based on complex or aged programming languages — which makes it all the more difficult to maintain or extend the code.

Here's the good news: the best of both worlds can be created by bringing back the functionality to out-of-the-box usage of the ERP system (or simply leave the custom code alone, in the case of bespoke software) and at the same time introducing a high level of agility, by means of externalized 'process apps'. All without customization or coding.

The ERP system is used as originally intended and designed, resulting in more predictable behavior of the system related to usage and performance, maintained in a more standardized and cost-effective way. The process app externalizes the needed functionality into highly customizable solutions outside the core applications. They're supported by rules engines and task inboxes and can be delivered to different channels, including — notably — mobile devices.

Let's look at an example that brings it all together: the hiring process for a new employee at a University. Oracle PeopleSoft HCM is used as the HR system to store employee details. In the hiring process, an authorization scheme is involved for getting the approval to create a contract for the employee-to-be. In the University world, this authorization scheme is complex and may involve several faculties (with different organizational structures) and even cross-faculty organizational units.

Introducing such an authorization scheme into PeopleSoft would require a lot of customization. By adding a handle inside PeopleSoft towards an externalized authorization process app, the execution of the authorization of the employee is done outside the ERP. It uses a process management tool (for example Oracle's Business Process Management Suite or Pega) that delivers approval schemes via a 'work list'.

While the process app here works as an add-on to the PeopleSoft system, it can also be extended to support the full life cycle of the end-to-end hiring process, with the possibility to involve multiple applications. The actual core functionality is kept in the supporting the ERP system, while the process app acts as an umbrella to control the end-to-end flow and provide insight into the efficiency of the overall process.

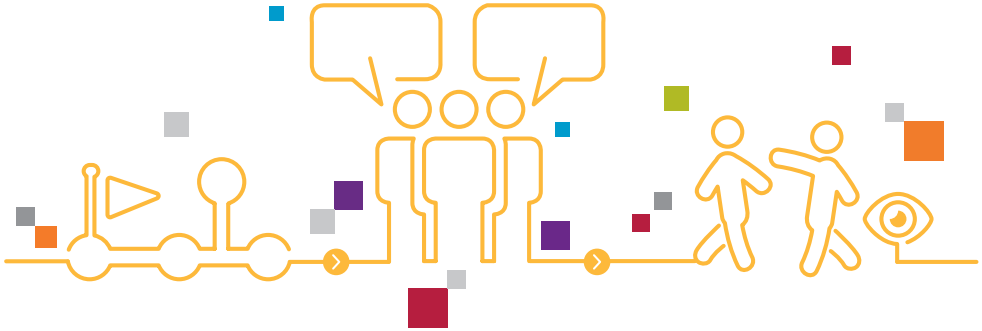
How to get there? Bringing the flexibility outside the core application into a process app can be done from two extremes:

First of all, the most basic one: age. At some point, a technical upgrade is needed for the ERP. A typical scenario would be, when the product version is out of support or is not working on a new version of the operating system anymore. Technical upgrades are a good time to consider more radical rationalization scenarios, particularly for getting rid of excess customization. Aim for a plain-vanilla upgrade — right from the catalog— and investigate the potential for flexibility outside the ERP system, implemented via process apps.

The second reason aligns with our Silo Busters concept. An 'umbrella function' is needed across the silos. Process apps contain the process logic, rules, and information to deliver the business outcome, supported by the functionality contained in the core systems underneath.

Applications are good, but processes can be better. Particularly when they bring new levels of agility and responsiveness without ever needing a single line of code.

CO PROCESS



Your expert
Fernand Khousakoun

Business Process Management Tools originated from platforms that focused on fixed, predefined workflows. Nowadays, the newest BPM platforms include all types of social networking and process improvement support via different channels. This way, even the early development plus deployment and continuous calibration of processes can be done much more collaboratively. Processes will furthermore 'listen' to social networks, and you might even become 'friends' with a process to follow its performance and progress online and in real time.

Process on the Fly

An organization's processes have traditionally been viewed as a *secret sauce* in their success and hence treated as closely guarded assets. This lack of transparency is compounded by multiple overlapping silos within organizations, each governing their own set of processes. This has inhibited the flow of information within enterprises, leading to the rise of *information and process autocracy*.

In our view, this absence of process collaboration will be increasingly seen as harmful for business in a highly connected world. Organizations are being forced by market dynamics and consumer expectations to not only adopt, but also embrace *information and process democratization*. In this new scenario, customers, partners, and suppliers expect to have real-time access to relevant and meaningful process information during their business interactions.

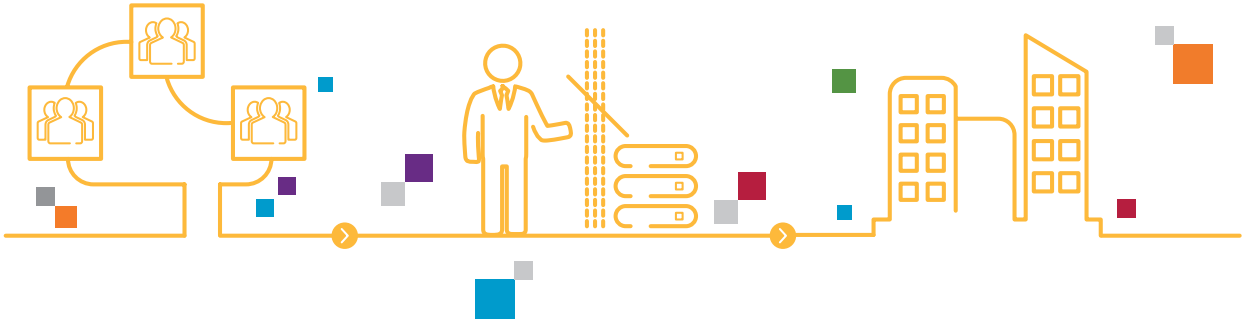
Leading BPM platforms have stayed abreast of this paradigm shift, by introducing dimensions of a much more collaborative process environment. The likes of Pega, IBM (Blueworks Live), Software AG's Aris Cloud, and Salesforce have embedded collaboration capabilities at the heart of their platforms, from modeling a process to executing and optimizing it.

Today, internal and external stakeholders can participate across the spectrum of Business Process Management to deliver a truly collaborative method, capturing crucial process knowledge while doing so.

These platforms also facilitate certain aspects of the process to be shared with a wider audience, allowing ongoing feedback and improvement. One way is by 'listening' to social networks to understand consumer sentiment and linking it to the organization's processes. It's now even possible to become 'friends' with a process and follow its performance online and in real time.

Business Process Management thus becomes a living, participative, and rewarding activity. It's actually fun to be involved in processes that turn into co-processes.

SILO BUSTERS



Your expert
Lee Beardmore

An end-to-end perspective across departments, applications and even across companies is within reach. Process technologies provide several options to break down the barriers between business and IT silos, without the need to reconstruct the silos themselves. After all, silos are good, if you use them for the right purposes. An outcome-driven platform approach that harnesses modern BPM, SOA, Micro Services, and MDM best practices to 'wrap and trap' application silos, can deliver lasting IT agility and better business insight, without disturbing the stable assets that are captured in the underlying core systems.

Process on the Fly

In order to deliver an integrated customer experience and highly optimized operations, enterprises need to incrementally *align and refine* many different processes within the organization. This usually requires a frustratingly complex and painful integration approach. These systems usually remain untouchable outside their original department scope and focus. The key challenge is to *bust these silos* without complicating ongoing process simplicity and flexibility.

First of all, we should realize that silos are not *always* bad. They provide secure and proven transactions and often capture the enterprise's best practices. Silos should be valued on their significant merits, rather than being demonized. Still, despite the benefits (perhaps due to a history of ERP consolidation), IT departments typically tend to be inwardly focused on the *illusion of integration and control* and as a consequence, as much as 80% of the modern IT budget is still spent on maintenance and 'keeping the lights on'. This certainly also involves building all sorts of painful interfaces between the silos, trying to deliver on specific business requirements.

It seems all those fixed interfaces between silos are not exactly making matters easier or cheaper. This ailment is serious and requires treatment in the form of a concoction of BPM, MDM, and SOA *psychology* that should be administered *liberally* to all disillusioned areas of the IT function. The fact is that trying to replace silos with a new integrated replacement usually creates more silos. An outside-in mindset change is required to protect IT and business agility in the future.

An enterprise should start from a common business outcome, with the IT department ensuring it pulls only the *required* processes, rules, and information from an *interlinked event perspective* and finally, the business-digital divide narrowed by ensuring the solutions remain tangible against a measurable business outcome.

Something strange in your IT neighborhood! *Who you gonna call?*

If you're a *silo gate-keeper* spiritually looking for your *technology key master,* here are the five big tools you don't want to miss:

1. BPM simplifies cross-application workflow to minimize repetition of business logic and rules in the applications themselves. *Overrun by complex processes? Think* Pega, Mendix, IBM BPM, *and* Oracle BPM.
2. MDM reduces *interface hell* and translates *data on the fly. No consistent corporate view? Think* Informatica MDM, IBM MDM, and Oracle.
3. SOA eliminates interface overload and ensures adaptable process continuity across IT silos. *Experiencing API Armageddon? Think* Oracle, IBM, Mulesoft, Denodo, *and* Cisco.
4. A Data Lake reduces data movement between silos via a 'one-stop shop' for core event data. *Drowning into data silos? Think* Pivotal, Cloudera, Couchbase, *and* MarkLogic.
5. RPA reuses existing IT silos by automating tasks via existing applications without integration. *Error-prone IT madness? Think* Blue Prism, UIPath, and Automation Anywhere.

The role of the five silo-busting technologies is to simplify and automate processes through *islands of stability* that ensure typically federated events continue to work across business boundaries. It must also be ensured that the *delivery approach* considers smaller business-driven packages of change (or 'micro processes') that are delivered quickly, frequently, and with obvious business impact. It's about keeping data, rules, and logic apart, together for one key outcome.

So, what are my next steps towards official 'Silo Buster' certification?

1. Focus on common business pain and scope tightly

Get a C-level sponsor (the CEO works!) to align key stakeholders towards a shared benefit model unlocking departmental budgets, reducing duplicitous project effort, and finally, smoothing unnecessary resistance to the change being implemented.

Bring the ideals of the emerging 'sharing economy' to your internal departments.

2. Use an outcome-orientated approach with shared benefits over common business issues

Ensure that the scope of a project is constrained to just the processes, rules, and information that are essential to deliver the business outcome.

Monitor progress frequently, adopt agile delivery methods and consider multi-device technologies for speed.

Deliver 'snippets of business functionality' delivered on an agile multi-device basis.

3. Federate to accumulate, but do not integrate

Embrace concepts such as Process is the New App to wrap applications silos within an insulated agility layer of standard data, services, and rules.

Think 'events' rather than 'systems' to keep things in perspective.

Don't be afraid of silos. Bust them with process technologies, so that stability and best practices are combined with agility and oversight.

It's the best of both worlds — or *dimensions* if you like. And thankfully, no ectoplasm is required.

Your experts
Maarten Waage
and

Nicholas Kitson

NO PROCESS

Building on the next generation of Business Process Management, business rules, event processing, and case management platforms — new flavors of process can be modeled, executed, monitored, and managed. However, new technologies enable us to go even further.

Guided by context-sensitive and analytical insights, many fixed and inflexible processes can be replaced by concurrently or asynchronously executed activities — dynamically 'swarming' together — with the system to decide the next action and optimizing available resources. In the end, the ultimate process might only be a process in hindsight. This is the art of Process without Process.

Process on the Fly

Process models have become the tool to provide consistency, efficiency, and a path to process improvement. But today it's still infuriating to dial into a call-center and be told one thing, only to be told something else, when you call later. The reason: static processes that have two main drawbacks.

Firstly, they don't capture and guide behaviors very well. Secondly, process models are rigid and usually deaf and blind to unexpected events, new insights, and new needs.

Static processes don't foster innovation. They're not meant to. They enforce rules and consistency. However, when a customer requirement doesn't quite fit the mold, agents ask themselves, "What can I do? Surely, something like this has happened before." Human nature leads them to seek work-arounds.

TechnoVision 2015's Cognito Ergo Sum describes a world where analytical engines process masses of raw data from internal and external sources, to detect patterns based on context. The system can suggest options from history or make best guesses based on situational context. Dynamic case management then creates the alternate options or tasks as parts of the new process — all generated *on the fly*.

The system can manage so many options and micro-processes, that a 'process' of limitless options is finally tantamount to 'no process' at all, ushering us into a new era of cognitive computing and human collaboration. The systems choose the best alternatives, or at least, select a limited set of options based on specific circumstances for a knowledge worker to make the final choice. The challenge then is architecting these solutions, such that, they know best.

Today, we craft processes manually based on the options we know and understand. In the *No Process* future, we'll allow systems to define the most appropriate ad hoc process on the basis of thousands, maybe millions, of options — always selecting the next-best action thanks to raw computing power, ever-increasing processing speed, and context-based learning algorithms. Artificial Intelligence systems will write specific, *on the fly* processes, based not only on the facts of the case, but also terabytes of historic precedence, using machine-based learning to predict the most likely outcome.

It has started already: decision taking on loan applications was among the first implementations of the approach. Technology providers like Pega bring the agile process platforms to get rid of processes. For medical diagnoses computers increasingly define patient-specific 'clinical pathways' proposing the *next-best action* to medical professionals. One only needs to look at some of the IBM Watson implementations in healthcare to see more real examples.

Many of the traditional enterprise processes, thus will be progressively replaced, leaving us with a *controlled fluidity* that satisfies our ever-evolving demands. That's what *No Process* looks like.

You Experience: The User Experience at Digital Speed

Your expert
Michiel Boreel

The adoption of mobile devices into our lives and the emergence of systems that go far beyond apps have created an innovation wave that changes the way we engage with organizations. We expect them to be in sync with our digital behavior, creating the ultimate user experience: customized, context-specific, task-oriented, elegantly designed, and downright fun to use.

"We shape our technologies and afterwards our technologies shape us."

According to the famous words of Winston Churchill, we already saw it coming for some time. Ever since the introduction of the iPhone in 2007, our information behavior has changed at a tremendous pace. On average, we take our mobile device out of our pocket 160 times a day! We expect ubiquitous connectivity and immediate answers to any question or demand we have. We use brilliantly designed apps — *true objects of desire* — that are fully optimized for the task we need to accomplish. The sensors in the device detect much of our specific context, in addition to geographic location. Furthermore, the device is aware of our identity and will share it with the outside world, if required, for success.

Many organizations think that this wave of mobile devices and apps is similar to the rise of the web a decade earlier. Mobile-commerce is the same as web-commerce, only on a smaller screen, right?

Well, not quite.

Mobile means much more than just an additional channel. It requires a dramatically different organizational mindset to meet the expectations of the digital customer. Processes and data have to be tuned to make an instant response — based on real-time insight — possible.

Employees must have technology available that at the very least, matches their customers'. The focus of organizations must be on creating the ultimate customer experience: a true *You Experience* that is fully customized not only to the individual, but the situation she is in — an experience that creatively builds on the available technology of *"No Keyboard,"* and the digitally augmented 'Me'. It's an experience that is immediate and accomplishes the task precisely — leveraging relevant data, whatever the structure, wherever it comes from.

What's true for the relationship between organizations and their customers, is also true for organizations and their employees. It's not just to stay in sync with the expectations of customers, but also to produce a workforce that works in different ways, places, and times with superior results, a higher motivation, and a much better work-life balance.

Welcome to the world of the You Experience. You're in for a fascinating ride.

Your experts
Menno van Doorn
and

Frank Wammes

NO KEYBOARD

The keyboard to a computer is like the steering wheel in a car, or money in a wallet. They're all quickly disappearing. It's for the best too. Reduction of friction between intent and interaction creates new, unheard business opportunities in different areas. The interface to computing and the network will be visual, audible, sensitive, and 'sensorized'. Enterprises that know how to take advantage of these new ways of making contact with their customers could equally reposition their existing business and create disruptive new models. 'Contact' becomes the new 'content'.

You Experience

Close your eyes and imagine this scenario in the future. Does your self-driving car still have a steering wheel and does your computer still have a keyboard? The answer probably is no. The impact can hardly be overestimated, since all these interfaces involve important processes like paying, transportation, and the production and consumption of information. When all these processes change, humanity changes. From a business perspective, technology reduces or extremely simplifies interfaces, leading to easier contact and a radically different view on interaction and value.

By electrifying the keyboard with the invention of the modern telegraph around 1870, we were for the first time able to *teleprint* messages over long distances without the interface of a Morse Code key. Digitizing the keyboard created the computer terminal by which man could exercise computing power. 'Glassing' the keyboard made the computer mobile and ubiquitous.

The next step will be 'gluing' the keyboard to any surface, creating new means for interaction based on touch and sense, in effect rendering the keyboard itself useless. The disappearance of the keyboard is part of the ongoing digitization of interfaces seen in many other areas.

If the old paradigm was *text and keyboards,* the new one will be *visual, audible, sensitive, and sensorized*. An appetite for connecting things and sensors expands the boundaries of an enterprise. This direct linkage of conventional information systems with new data sources will create all kinds of *interfaceless, frictionless* business processes. More than that, it will create a new data explosion, business can leverage.

Sure, we all get the potential (or ramifications) by now of Google Glass and Apple's Watch. But specifically leveraging the variety of data, existing enterprise data combined with sensor or location data will become extremely valuable and potentially disruptive.

Real-time information from wearable devices — such as Microsoft's Band — combined with electronic patient records for instance, enables a new style of healthcare. Predictive and prescriptive analytics in many other sectors will become the dominant way to organize maintenance, spectacularly improving the leverage and availability of assets.

The business focus will be on serving customers and employees in their *mobile moments of need,* removing any friction that would stop them from getting their products and services. Just taking a product in your hands becomes a new customer touchpoint, creating valuable information through contact. *Contact* becomes the new *content.*

And contact can be anywhere. Remember, it's all about sweating the assets. It may simply involve an iBeacon recognizing a smart phone, enabling a direct approach to a customer in a shop, and to offer specific promotions based on their purchase history. It could also recognize somebody lifting a product from the shelf in a supermarket.

Technology that sends information through the human body to a smart phone after touching an object is already available (using BodyCom technology). The movement of a postal packet for instance, is enough to transfer information about delivery completion. Advanced body- and sense-enabled technologies are making QR-codes obsolete. Printed electronics (smart paper) are paving the path for new direct interaction where the only interface that remains is the touch of a finger to the object of interest.

In a world with fewer keyboards, a computing device no longer takes the center-stage. It redefines the way we interact, with technology silently morphing itself to whatever we need. Enterprises that get this will be superior in earning the attention of their customers, employees, and partners. No keyboard, no friction. Do we have contact now?

OBJECT OF DESIRE

Your expert
Andreas Sjöström

Nowadays, we're spoiled, 'consumerized' users of technology. We expect compelling, aesthetic user-experiences as a default from our favorite devices. If that expectation isn't met, we disconnect both in our role as consumers and enterprise workers. Therefore, create desirable apps that facilitate specific tasks and contexts, and hide what's underneath. Apply design-thinking, gamification, and responsive design, so that the apps morph into the overall experience of clients and enterprise users. Turn your mobile app store into a candy store and enable any device.

You Experience

In the age of the customer, there are no shortcuts for enchanting the user across all digital touchpoints. True enchantment comes from an amazing user experience, implemented in context-relevant functionality and stunning visual design. In those rare cases, an app becomes an *object of desire* and customers become fans and the most loyal advocates of an organization.

But expectations are extremely high and competition, fierce. If the customers' needs or expectations are not met, they're likely to leave and find other options with a single keystroke — or more appropriately in the era of No Keyboard, the blink of an eye.

For instance, a recent survey in the insurance industry — typically assumed to having a slow-moving customer base — found that even the majority of deeply engaged customers would consider switching insurers on the basis of an improved online experience.

Significant business opportunities are clearly in reach, as deepened ubiquitous engagement drives revenue and improves customer loyalty. But the flip side of the coin in this age is that not acting will possibly alienate your customers and will seriously challenge your continuity.

We rely on a multitude of online services, 'responsive' websites, and apps for business and pleasure. For all practical purposes, mobile devices and *wearables* have become the remote controls of life, enabling us to manage everything from relationships to financial transactions. Ordinary everyday things around us get connected, driving even further, our information behavior. As connectivity reaches even deeper and wider, so does customer engagement. The importance of an amazing user experience increases rapidly.

Engaging and inspiring user experience across all channels, physical and digital, give products and services unprecedented attraction and reach. Digital convergence, stunningly crafted, is a key priority in Digital Transformation agendas. This means designing a coherent *omni-channel* experience around every individual customer, crafting a true You Experience.

User experience and user interface design is about creating what's relevant and engaging. For a customer moving around in a connected world, context is what drives relevancy. Context is defined by a number of things: location, proximity to places and sensors, preferences, past behavior, interactions in social networks, and so on.

Digital touchpoints need to demonstrate immediate value, prioritize core functionality, and dynamically organize content, so it's relevant to the user's context. In a You Experience, it's all about meeting immediate and personalized needs.

Engagement can also be accelerated using different types of relevant *gamification*. For example, use top lists of opted-in users based on activity, create levels of achievements, and award the highest achievers with perks and offers. Badgeville should be checked out for its multi-channel 'behavior platform', which aims to engage both customers and employees.

The road to success? Creating winning solution concepts starts with understanding *what* and *when* is relevant in terms of information and functionality. The so-called *mobile moments* providing features that change appearance depending on context, can enchant users. Connectivity with other connected things or services in open ecosystems of data can further enhance the experience.

You Experience

Apps on any platform, screen size, or responsive sites need to be gorgeously designed. Functionality alone isn't enough, not even when it's really context-relevant. Customer engagement and user experience requirements have become business-critical. Most successful innovative and stunningly designed solutions were the result of agile design-driven development. Focus on context and dynamic content, not on chrome. But most importantly, focus on the task at hand.

Furthermore, consider these three key rules to create successful user engagement:

- Focus on more than performance and functionality: know when and why a mobile solution is needed and how to make it fit for purpose.
- Prioritize end user testing and feedback: testing mobile solutions is essential for a robust multi-channel experience.
- Link to the required information and systems: no digital interface — no matter how well designed — will succeed if it's not tightly integrated with back-office systems.

And finally, among the organizations that are successfully creating *objects of desire*, the following best practices emerge:

- Use personas and scenario maps to identify relevant contextual value.
- Define and maintain scope and requirements using sketches and mock-ups.
- Design consistent style sheets and mood boards used across all digital channels.
- Collect feedback from users in target groups using prototypes.

Regardless of what solution is taken on next, if it's an app, a responsive website, or a wearable, following these best practices maximizes the chances of being taken to the user's heart, as an object of desire.

GET A LIFE

Your expert
Fernando Alvarez

As the divide between our personal and work-life blurs, consumerization is making us sensitive to exciting and desirable user experiences on the mobile devices of our own choice. Mobile Device Management helps us to stay in control and keep heterogeneous platforms secure, thus satisfying business-level requirements. However, mobile operating systems increasingly support mixing private and business roles, while bringing us the next level of user experience. It's a matter of finding a healthy balance between the perspectives of the consumer and business professional in order to get the most out of the mobile revolution.

The explosion of smart phones and tablets has resulted in consumers bringing their own devices into the workplace. It's becoming a firmly accepted business practice simply because employees empower themselves with the best technology to be able to respond to the heightened expectations of the digitally empowered customer. In turn, the need to manage and secure those devices has given rise to sophisticated Mobile Device Management (MDM) tools and security applications. Cloud-based, scalable, and affordable MDM solutions such as AirWatch are now widely available on demand.

But if enterprises are to maintain a truly secure and carefully managed environment, while also providing their employees with a dynamic and exciting consumer experience, there's a strong case for Bring Your Own Device to be transformed into Bring Your *Office* Device — providing company-issued devices that can be used at work and away from the office for consumer applications.

Operating systems such as Windows Phone 8 and Windows 8.1 (but increasingly also iOS and Android and let's certainly not rule out BlackBerry OS) can provide a rich consumer experience as well as powerful and secure business functions, helping organizations and their employees to create a new work-life balance. Employees are more likely to adhere to company policies for example, if they're able to switch identities easily between business and consumer. It's no coincidence that IBM and Apple embarked on a partnership that aims at enterprise mobile users, marrying the enterprise-grade attributes of IBM's MobileFirst platform with Apple's notorious design qualities.

There are some key practical reasons for companies to issue devices to employees, starting with security. By owning and managing devices, companies can be certain that they're able to lock them and wipe sensitive data remotely in the event of theft or a security breach. As a result, enterprises are more likely to provide employees with access to critical data and applications through a company-owned and company-managed device — often leading to greater productivity. Company-issued handsets also manage and encourage the use of branded enterprise apps and content.

Whether businesses restrict mobile device usage to company-issued products or encourage a Bring Your Own Device strategy, consideration must be given to the apps themselves and how they're secured, managed, and deployed. Apps and data must be secure across all devices. Mobile Application Management (MAM) complements device security by wrapping apps and data individually at the application level. Encryption and other security controls offer data protection and access control while still giving users the mobile experience they want.

Enterprises need a coherent, end-to-end policy strategy and a flexible content-management system to manage corporate and consumer apps running across different operating systems. And they need data-loss protection controls that restrict the forwarding or accessing of sensitive data.

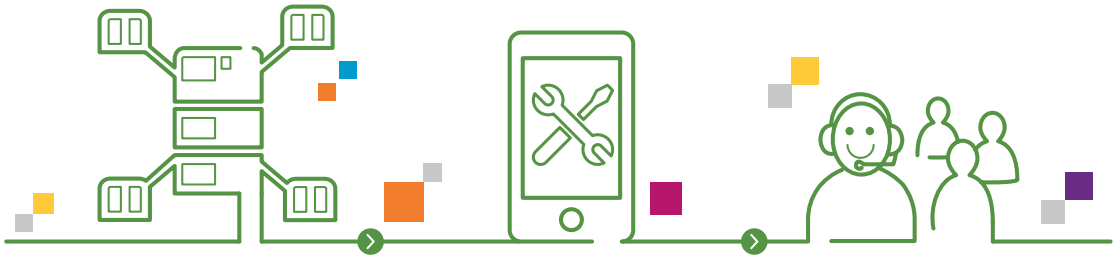
It's time to assess the potential merits of a *Bring Your Office Device* approach. Enterprises could take greater control and use the full capabilities of an increasingly business-oriented mobile OS, issuing a company-standard device that is easier to manage and secure and — by switching to a different identity — also satisfies consumer needs away from the workplace.

In the end however, no matter what approach an enterprise chooses — Bring Your Own Device or Bring Your Office Device — it's key to understand the dynamics of our rapidly intertwining business and work-lives and turn it into a proper mobility strategy. This is where the new value is hiding. It certainly brings a new meaning to the 'get a life' catchphrase: from now on, it's about minding your own *and* your business.

Your experts
Arthur van den Boom
and

Jacques Mezhrahid

END USER END PRODUCER



So many opportunities for mobile apps, so little time to build. Why not let others do it? The IT department of an organization may need to shift its focus to building a mobile 'hub', instead of building the apps themselves. Such a platform consists of a catalog of secure, enterprise-grade services, tools, and APIs to catapult new apps. They can be built both inside and outside the company by individuals, business units, and external partners alike. Mobilize, enable, and support your mobile end users; they will produce the greatest apps in return.

By now, it would be the mother of all clichés to state that apps are here and they're here to stay. It's crystal clear that the app effect will drive the nature of solution development for years to come, with new mobile devices driving the revolution even more. But there is a completely different way to leverage the change. It involves letting go the illusion of control by central IT, mobilizing de-centralized crowd power instead, and creating nothing less than an API Economy.

Many organizations have spent a lot of money and effort building apps to engage with their customers and employees. But they feel themselves continually challenged by the need for new versions, new services, and even support for new devices. What was great just a couple of months ago is just good enough today, and will be subpar in just a little time. The excitement of yesterday turns rapidly into the disappointment of tomorrow. It's an unpredictable world where nothing stays the same for very long and the velocity of change is tremendous. Many organizations struggle with this turbulence and find it difficult to prioritize on what needs to change first. It's a tough job to get the right requirements from the business side anyway — volatile as they are — and budgets are often limited.

The result? Impatience and dissatisfaction at the business side, the customer base, and the work floor. In some organizations, often out of frustration, business units choose to take matters into their own hands and develop their own *rogue* apps or new services, potentially creating risks around security, integration, and manageability.

The challenge is to find a way to be flexible and robust at the same time. This means flexibility in creating and delivering new apps and features to the organization quickly, while also being robust by guaranteeing an acceptable level of enterprise-level integrity.

The good news is that there is a way to improve the interaction between the highly digitized and consumerized outside world and the internal world of corporate systems. This is where *Application Programming Interfaces,* or APIs, come to the rescue, giving access to crucial data and actions within the corporate systems. It also involves high-productivity frameworks, tools, and services to quickly build powerful, safe, and consistent mobile apps. More than anything however, it requires the organization to challenge its incumbent mindset.

Making best use of their mobile platforms, established companies must think like a *start-up*, where the mantra is pushing out solutions to customers as quickly as possible and then carefully monitoring the use and feedback from real people. This analysis will show the way towards improvement of the next version that will again be pushed out usually in a matter of weeks. During the different iterations, the needs of the user served remain the same, but how to serve them can change drastically depending on what works and what doesn't.

Publishing corporate APIs outside the IT department — and leveraging external APIs — to speed up development will bring opportunities to connect to an external ecosystem of developers: a *crowdsourced powerhouse* that the organization itself would never be able to match.

One way that start-ups innovate at such an incredibly high pace is that they always look externally for reusable APIs and platforms first. Only when nothing is available, they might develop services themselves. No *not-invented-here syndrome,* as they know that speed of delivery trumps almost every other concern. They focus their own means exclusively on those areas where they can truly create something new and differentiating and leverage APIs and services for everything else.

This approach is logically tied to an agile way of development and operations, not only of the required IT assets, but more and more of the business processes as well. It changes the classical predictive approach of IT along a fixed roadmap into a more experimental journey of developing the business processes and the technology in concert, constantly adjusting the direction on feedback and data collected from real-world usage.

Good tech will also lead a brand. New business opportunities will flow from publishing business information in a usable and valuable way through well-defined and publicly available APIs. Customers, suppliers, and partners will use that data for their own purposes, whether to serve a need, or make their own processes more effective. Whatever the usage, sharing quality data and services improves corporate image, and thus elevates the perceived value of the enterprise.

Companies are using platforms to build ecosystems of partners to explore new consumer-focused business models. Take a look at IBM's Bluemix, which is not only a prime example of a powerful mobile development platform, but also makes IBM's entire product and service portfolio available to build on (anyone for a few Watson APIs?). And what about Google's Nest Developer program — a complete ecosystem supporting consumers to save energy? Even Apple — not necessarily notorious for sharing its assets in the open — drives new ecosystems, for example with Homekit.

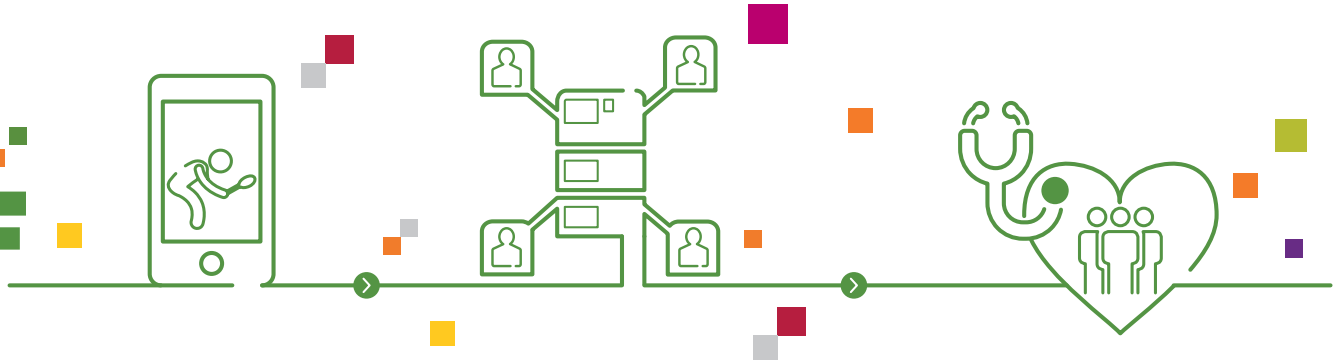
Online retailer bol.com (find their APIs here) has been actively working on positioning its APIs to the outside world, rather than focusing on building its own mobile apps. The result is a whole series of apps, all incorporating access to the bol.com platform. There is an enthusiastic developer community, actively supported by the organization. Contests are held and — maybe even better — commissions are earned when an app is being used by customers to buy items.

'Users' — whether inside or outside — thus may turn out to be the favorite producers of an enterprise. Or to put it differently, the most successful sales people might soon be developers, creating solutions with APIs. Who would have thought?

Your experts
Erik van Ommeren
and

Arnd Brugman

DIGITAL SELF



Man and technology are merging, in fact converging. First, by processing and storing increasingly personal data, then by bringing technology physically closer to our bodies, and finally by creating things that think together with us. From the wearables and the 'quantified self', to the body implants of the trans-humanists — toward the dream of embedded artificial intelligence, the opportunities for business disruption are limitless. Imagine the possibilities when technology starts to augment our human nature and even our very being. What if there is less and less difference between you and your Digital Self?

You Experience

Continued miniaturization has made it possible to move from standalone computers to portables, to smart phones, smart glasses, smart watches, smart bands, and smart contact lenses. Health and fitness gadgets are measuring the rhythm of our lives, our bodies. They measure to help us be healthy. Where will it stop? Soon, doctors might inject us with a smart chip that continuously measures our blood pressure, chemical contents, oxygen level, and who knows what else, scanning for the very first signs of a disease.

Whatever ethical discussions are rightfully going on, *if it can be done, it will be done*. Better health, better senses, better physical performance, or better thoughts — throughout history, we've taken every opportunity to achieve these goals through our food, machines, chemicals, and so on. This will continue as we continue leveraging the latest technology of cyber-physical connections that aim to enhance us. Technology becomes an extension of man and — in a certain way — man becomes an extension of technology.

Connecting humans directly to the digital realm makes previously hidden data available. The amount, and especially the type of data is changing. From abstract and almost anonymous data to storing our likes and dislikes, our social interactions, our sentiment, and now our impulses and — who knows — our inner thoughts. Digital brain-reading — literally capturing thoughts — is already becoming a reality. Many researchers have made great progress in analyzing brain patterns, enabling brain-to-brain communication to directly read visual nerves to measure the moods and thoughts that were, until recently, hidden.

Meanwhile, IT is shifting too. We used to build core applications to store and retrieve data. Nowadays, we focus more and more on our interaction with customers, employees, and partners. And now, we're enriching it with *empathic computing* — aiming to create the best interaction, leveraging physical and intellectual context, history, and patterns.

As always, cross-pollination leads to acceleration. For example, better and smaller control systems lead to new applications of robotics that were beyond our reach before. It makes seemingly futuristic things possible: smart replacement limbs for amputees, upright walking robots, and flying drones. We now are starting to see the first truly autonomous robots, swarming around us to clean, deliver packages, or do surveillance.

Replacing a missing hand with a robotic one makes perfect sense. To make it somewhat smart and connect it to nerves or the brain for seamless operation is also logical. To replace an eye and feed visual information into the brain helps people navigate the world. Slowly but surely, we're learning about the inner workings of our nerves and the brain.

On the hard technology side, we're getting better at dealing intelligently with data, finding patterns, establishing correlations, and predicting the future. With cognitive systems like IBM Watson and other learning machines, systems that think seem within reach.

There will be a time when both ends meet: when the technological advance of machine learning plugs directly into the latest understanding of our brain. Then the computer becomes a prosthetic for our brain, seamlessly taking over those functions that it's better at — enhancing our intelligence.

You Experience

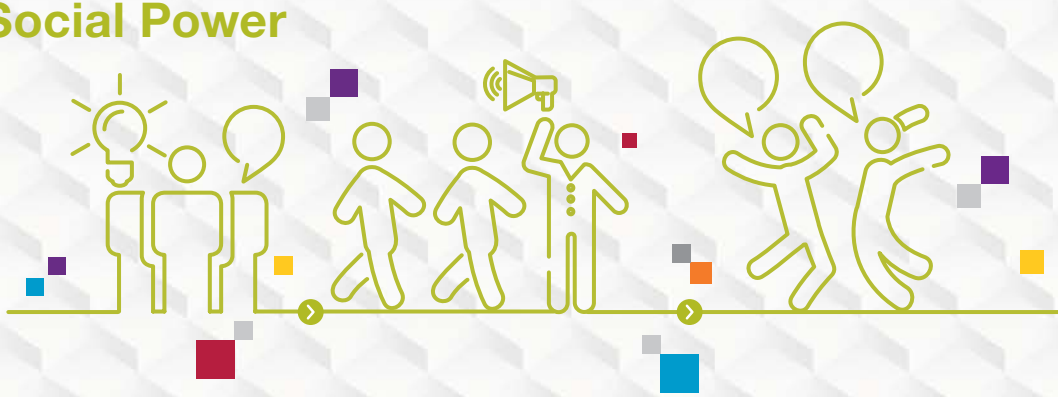
Thinking 'things' have long been the realm of science fiction and doomsday movies; but the reality turns out to be much more mundane. It will show in increasingly accurate decision support, better recommendations, more natural and frictionless interfaces, and more intuitive interactions. Thinking computers will help make sense of the overload of data that is bombarding us to make better choices. Enterprises that see the potential of this marriage between man and machine earlier than others, can achieve greater benefits, allowing them to create disruptive business models that, until recently, were beyond imagination. It may happen first in healthcare, insurance, retail, security, and defense.

In the end, there is no way to predict what happens next. When machines really 'think' and become one with us, it will change mankind more than the invention of fire did. There are dreams of copying our brains to disk so that we can live forever. There are dreams of globally connected minds living in harmony. There are dreams of globally tuned supply and demand of everything. There are dreams of mankind expanding into the universe. There are dreams of hope and ambition.

There are dreams…

We Collaborate: Harnessing Social Power

WE COLLABORATE



Your expert
Rick Mans

'Social' is no longer simply about new ways of collaborating with customers. It's now business as usual. As a logical companion to the technology — that drives individualized user experiences — social delivers the power of connection to the individual, and if permitted, to the entire enterprise. Leveraging the potential of social will not only improve customer experience, it will positively impact the operational processes of an organization. Furthermore, many recent business model breakthroughs have been driven by social innovation: social often equals disruption.

The next level of collaboration has many different faces and social power should therefore, be considered in the following ways:

- Enterprises must explore the different dimensions of 'social', in order to understand where it creates new opportunities. It's literally a search for the *new oil*.
- The aspiring 'Digital Enterprise' has to invent new ways to put knowledge in motion, and to unleash collaboration — making employees social workers who will leverage social platforms within and — a fortiori — across organizations.
- The empowered, collaborating individual will obliterate traditional notions of privacy, command, and control. Enterprises need to understand how to create and manage trust in an increasingly complex egosystem.
- Enterprises may want to consider socially integrated business operating models, where certain traditionally internal tasks and roles are 'outsourced to the crowd.' It may mean less work or even no work, but must not lose the crucial brand touch internally.
- Eventually, being connected reaches the Internet Of Things, with smart devices and sensors potentially becoming part of the social network. To friend a machine may lead to an unexpected, yet highly beneficial relationship.

As individual consumers, we always expect to be connected, to get answers in real time and to be able to collaborate on our own terms. We now need to repeat the same dynamics across the wider enterprise.

The power of 'Me' and the power of 'We' are here. Will enterprises harness social power or be utterly overwhelmed by it?

SOCIAL IS THE NEW OIL

Your expert
Rick Mans

The power of social is here in many obvious and some less obvious ways. 'Always connected' consumers share not only what they think, but also what they actually do. However, getting closer to the needs and actions of customers may just be part of the strategy to leverage the power of the crowd. With opportunities to apply social energy to internal operations, or even to create entirely new, disruptive business models, a real sea change is required to determine where the ultimate benefits exist. In the end, 'social oil' could turn out to be the most important business asset of them all.

We Collaborate

We care what people say in our personal lives. The question is, why don't our enterprises care just as much?

Brand sentiment and customer intent are the new tools to win and retain consumer loyalty. If we can ascertain the intent of an individual or demographic and tailor our customer experience quickly, that would be massive, wouldn't it?

The heart of the 2015 boardroom needs to *beat to the 'tweet'* of consumer intent. With social sentiment now a key digital commodity, investment in tweets rather than seats (physical, channel-based interaction) should be a core focus for the enterprise. This requires a paradigm shift in perception of the strategic value of social data, followed by a repositioning exercise across the entire customer experience, to truly assess where social could make that decisive difference.

If harnessed correctly, social oil is a ubiquitous fuel to power real business value from social customer relationships. Nowadays, this is more important than ever, due to the massive increase in global event-based 'fast data' and the accelerating influence of the ever-connected Internet of Things.

Although social oil has its own intrinsic value for remaining in touch, in 2015 it's no substitute for sustained active participation in the now burgeoning crowd-based sharing economy. The 'power of we' is driving a new modus operandi, as customers become part-time employees of a connected brand with communication, sharing, ideation, and creation of new products and services a 24/7 cycle, no longer solely within the organizational boundaries.

Transforming social event data into meaningful customer experience intent and action requires the establishment of 'social oil refineries' powered by technologies such as Radian6 via frameworks like Social Insight Into Action to deliver social differentiation in an increasingly digital brand economy.

Are you now feeling the power of social? If so, turn it into value beyond a simple customer experience improvement by tapping into the collective insights and brainpower of a connected workforce, crowdsourcing traditionally internal work and actively co-creating with progressive business partners. Once this social platform has been unleashed, there may be no limit to the scale and pace of enterprise growth delivered: the era of disruption is now running on social.

Whatever enterprise social assets you may possess, here are three tips for getting started whilst ensuring you're suitably prepared:

1. Create an external social oil refinery to gather brand, product, and market sentiment

Focus on specific customer experience-led outcomes. Start small and prepare a centralized store of clean and irrefutable customer — and possibly machine — event data on which to deliver social media monitoring needs. Think Salesforce, Brandwatch, Crimson Hexagon, GNIP, Google, Sysomos, and Lithium.

2. Develop a workforce-to-customer interaction network to keep the enterprise in sync

Consider sharing platforms, cognitive computing, and robotic process automation to accelerate the capture, interpretation, and refinement of 'sentiment change' across the enterprise's network of influence. This will create the foundation for conversion of 'insight-to-action' on a real-time basis. Think Shrebo, Watson, and Blue Prism.

3. Build an always-on, real-time 'Data Lake' for 24/7 social analytics and insight

To ensure that you're constantly responsive, you will need to store everything at speed and analyze anything on demand against a set of actionable metrics across your key points of process interaction. This will require massively parallel 'fast data' capabilities. Think Data Apart Together and platforms such as Pivotal, Cloudera, Couchbase, and MarkLogic.

Harness 'social oil' and embrace social power as the channel for your organizational journey towards a mutually beneficial customer experience.

EGO SYSTEM

Your expert:
Kees Jacobs

The biggest sensor known to the human race is not a phone. It's not a tablet. It's certainly not a wearable. It's 'you.'

The social economy thrives on individuals that share their personal data with others while connecting value to context. Consumers now realize how much this asset is actually worth, while increasingly doubting privacy and who is monetizing their profile data. Enterprises that look to leverage this complex *'egosystem'* must balance creativity in finding new ways of engaging customers with creating a mutual feeling of trust, transparency, and benefits.

Always online, always connected, routinely sharing information about themselves — likes, dislikes, buying behavior, sports achievements, political opinions, also their whereabouts and even health status — consumers have now become digitally literate and 'quantified'. What's more, they're beginning to leverage the tremendous value of the data they provide. They feel that enterprises should think the same way and explore new business models to use this mutual dataset for a better customer experience to sell more and — in the end — deliver bottom-line benefits for all.

With profile data as a core asset — as the new currency — consumers actually have become the *keystone species* in a complex, connected ecosystem of stakeholders. They rule their own *egosystem.*

Enterprises that aim to leverage the power of egosystems can create a much better customer experience by analyzing and predicting against the profile data of its social network. Who is entitled to make money with these personal assets, however, and where exactly does customer intimacy end and the *creepy zone* begin?

- Will customers always value being 'recognized' by technology when entering a store?
- Should a bank monetize day-to-day client transactions by selling it to retailers?
- Could TV and radio channels do the same with viewing preferences of their audiences?
- Do customers appreciate targeted ads within the confines of social private conversations?
- Will a credit card reject payment when its owner tries to order junk food for the sixth time this week, and the wearable cholesterol sensors reach alert levels?
- Should a restaurant give menu recommendations based on previous meal preferences — and those of friends — plus other client restaurants visits in the past?

Egosystems of today and tomorrow should be considered as a *trading place* where personal data may be bartered for products or services. It will be a *meritocracy*, in which there should be a healthy balance of 'give' and 'take'. After all, consumers realize that the more value derived from their data, the more the 'big brother' collective of enterprises, administrations, and social friends will gain.

If the egosystem is shared, who should benefit from this data?

Should anybody be allowed to extract data and make highly personalized offers, or even worse, influence consumer behavior to let them do things someone wants them to? Think about how Facebook influenced the mood of many recently, just by reorganizing their news feed.

We Collaborate

Clearly, from the consumer's perspective, it's their egosystem: a place where they lead and define the rules, which others have to live by. A healthy thriving egosystem thus requires three simple guiding principles:

1. Each individual owns and controls their egosystem

2. It can be leveraged as long as nobody gets disadvantaged

3. It's there to serve the individual (taking rule 1 and 2 into account)

Traditional business models do not cope well with egosystems. Enterprises will need a radically different approach. To the companies out there, still trying to find 'privacy loopholes', in order to continue to manage and own individual data using traditional marketing techniques: they're on borrowed time. The tables are about to turn.

Individuals will only share data if it provides them net personal value. Enterprises therefore have to fundamentally rethink how to propose long-lasting relationships that are mutually beneficial. It means open and collaborative business models are now crucial to create that next level of symbiosis.

Trust and transparency are absolutely imperative. As a brand looking to leverage the sharing economy boom while maintaining consumer trust, the challenge is to adopt a balanced set of customer engagement principles. They will ensure that individual data is used to improve brand-to-consumer experience for the benefit of all. The social egosystem success depends on it.

SOCIAL WORKERS

Your expert
Christoph Bauer

Future generations of workers will expect business applications to work just like the social media they use every day. This isn't just a matter of choice — it's a question of productivity. Free information flow and peer-to-peer communication has proven its ability to traverse organizational barriers to information sharing and innovation. Consumer-style interfaces fuelled by gamification, in conjunction with the power of the crowd, are no longer a gimmick. They're imperative. A new era of social communication with the potential to drive tremendous growth for the business has already begun.

Enterprise social networks such as Yammer, IBM Connections, Jive, or Salesforce1 Chatter as well as established global consumerized web and mobile platforms such as Facebook may be nothing new, but a successful corporate social business case study is.

The success stories surrounding these types of social solutions may have a viral following as vendors attempt to generate the necessary hype. Is this destined to become a sustainable trend that will ultimately change company and brand communication forever?

Putting 'Social' at the center

We're now at a point where we have to accelerate cultural change through the effective adoption of social technology. The CIO is well-placed to commence this evolution as she not only has the potential to consolidate application and data silos, but will also be able to harness the changing expectations of millennials due to her responsibility for future system usability and agility.

Do not transition business processes to the enterprise social network on a 'like-by-like' basis, however. Take a step back, and with a clear view of the business outcome in mind, redesign business processes to accommodate social in the center — aiming to ensure lasting business benefits.

Social tool excellence within the enterprise revolves around two main pillars: **design** and **openness.**

Design is especially important to the new generation of knowledge workers. They have never seen a traditional ERP or CRM interface and it's safe to say they probably don't want to. Social technology and emerging Cloud APIs can bridge the generation gap between corporate IT and collaborative social networks. It ensures new employees feel more comfortable in their digital workplace. Progressive vendors are starting to merge legacy corporate processes such as absence management into their social product offerings or add gamification techniques into the mix to increase process productivity.

Openness is about ease of access through many-to-many communication across the enterprise. 'Open Data' information flows (via services such as SYNAPP) underpin this approach to incrementally drive fast ideation and feedback cycles, based on insights across retention, employee engagement, and individual social influence scores.

This sharing economy focus also means that we now have powerful opportunities to collaborate with the outside world be it customers, fans, or suppliers — through a 'facilitated exchange' approach which can be clearly seen in recent corporate crowdsourcing successes at Lego, Dell, and Unilever.

So how to help my business become less anti-social?

Good products and services originate from the sustained internal excellence that employee-based 'social workers' strive for, every day. By incorporating *social moments* into an otherwise covert process, enterprises can harness

the combined capability of the workforce and its social network of brand evangelists in new and valuable ways.

This doesn't mean that the race to a socially powered business is without its hurdles. To accelerate adoption and usage of social tools enterprises should:

1. Empower 'socially aware' employees to breathe life into the business culture

Allow social tools, processes, and collaboration to gradually improve known 'customer experience hotspots'. Consider a performance management process that focuses more on ideal outcomes over fixed target objectives whilst promoting social behaviors.

2. Focus on the benefits of open collaboration rather than the threat to existing culture

CIOs should be the catalyst to collaboration rather than a barrier. Social collaboration by definition will span lines of business, systems, and IT silos. Embrace this approach to ensure the customer remains at the heart of all improvements.

3. Implement a reverse-mentoring process that balances social and corporate benefits

Operating as a 'social worker' is as alien to parts of the traditional workforce as cost management and governance may be to the average millennial. Implementing reverse mentoring to ensure collaborating at high pace, but low risk will be critical.

Bear in mind, with over 80% of modern knowledge work now focused on collaboration and sharing, enterprises may need a workforce of social workers by choice.

NO WORK

Your expert
Rick Mans

The power of social networks and media can now be leveraged to 'unsource' traditional internal customer-facing tasks. Customers help fellow customers, and customers help the brand they believe in, particularly in areas such as support services, product improvement, and idea generation. Therefore, today's connected customers and brand fans may become tomorrow's part-time employees in an 'egosystem' of collective social power. This goes well beyond basic cost cutting. It's actually about creating new value together. 'No Work' might well be hard work, but it could turn out to be the most effective growth strategy of all.

The best way to value customers is by making sure the perceived value of products and services is higher than the money they spend on them. When this is the case, the customer is more willing to go that extra mile. Enterprises might even need to consider offering incentives in exchange for the services of their customers. They could help design and QA for the continued benefit of the brand.

'No Work' is not a cost-cutting program — it's about making people care enough about the company that they're willing to support it above and beyond a simple one-off transaction. It's about leveraging a social 'egosystem' that creates value and productivity for mutual benefit. Future business models that are adaptive and that can extend enterprise operations into the burgeoning crowd economy will win, and they will win big.

Increasingly, powerful social platforms have the potential to cut out the middleman in product and service transactions. API-driven service foundations forge interconnections between people, machines, and sensors. They break down the traditional barriers between enterprises and third-party suppliers, employees, and customers.

Crowdsourcing is not just another brick in the wall. In the case of Lego's Ideas platform, this has moved beyond socially enabled brand management into a new form of product design, leveraging social power. Here, the crowd develops and votes on new potential products using a peer-to-peer Kickstarter-like approach putting the best ideas into production and returns 1% revenue to the original creator.

People need a platform to collaborate, interact, and share ideas with a brand. This new concept of 'unsourcing' has changed the dynamics of business models. Social brand fans just became zero-hour contract employees. This is the initial phase in a barrage of change from sharing economy models already proven successful at start-ups such as Concur, Uber, ZipCar, and VRBO.

Also, new readymade, highly scalable Cloud crowd platforms and APIs are emerging with the potential to remove large swathes of broker-based services. They do this by linking the social consumer directly with service providers in a new direct global platform of exchange, for example at BrightIdea, Shrebo, NearMe, and 'The Sharing Engine'.

So how do we embrace the benefits of 'No Work' in the 2015 organization?

1. Pilot crowd-based B2C processes

Typical organizational functions that could extend into the crowd include customer service, marketing, and even sales (remember the best sales people might turn out to be programmers).

Provide the community with the tools and platforms they need to do their work effectively.

2 Then consider co-creation

Consider adopting a sharing platform as part of the product or service ideation cycle. Again, tools and platforms may turn out to be pivotal as catalysts for valuable ideation. Consider gamification as a way to engage and communicate effectively with the brand community.

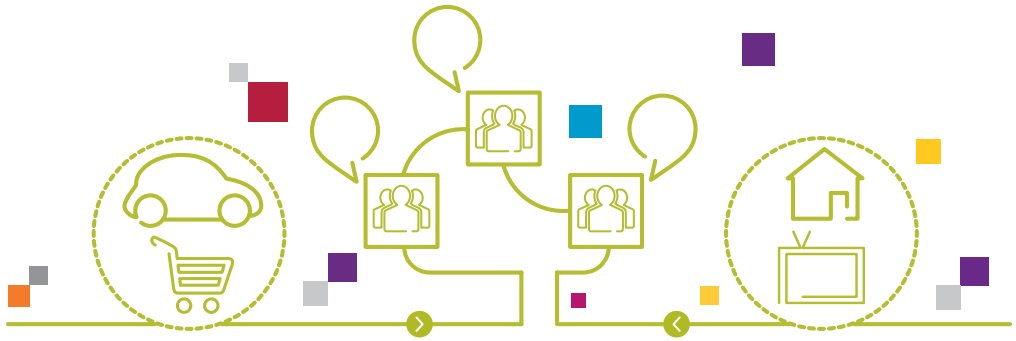
3 And always feed the egosystem

An individual's data is now in their control, not that of the enterprise. When this egosystem transition is embraced 'corporately', individuals will gladly collaborate with the brand for mutual value at pace. Make sure the requirements for a true meritocracy are being met.

After all, it's all about them. But in enterprise-terms it will take time to adapt to the increasing power of the crowd to deliver effective cost optimization, customer intimacy, and growth.

Yes, No Work means Hard Work. But what a rewarding journey this should be!

FRIEND THAT MACHINE



Your expert
Joakim Lindbom

Operational automation and IT are fusing into a new cyber-physical reality, powered by ever-smaller processors, better sensors, and network technologies. As IT 'gets physical', we're more and more connected to omnipresent devices and 'things'. The disruptive opportunities are in smart connected products, with the promise of a direct and proactive route into the hearts and minds of the consumer. It brings a whole new dimension to social networks, as future lists of 'friends' may soon need to contain some unexpected guests.

We Collaborate

Machines are becoming more intelligent and connected. They can now learn for themselves, adapt to their environment, and then share their experiences. Cars, road sensors, engines, fridges, and even vending machines are becoming equal members in a supply chain of value-based interactions.

Soon there will be over 50 billion connected devices, which turns out to be roughly about 10 for every inhabitant of the planet. This is no exaggeration. In my family, we've already passed 50 connected devices in our house and very soon, this will be widespread.

Whether we describe it as the Internet of Things or the Internet of Customers, organizations are currently struggling to adjust to the so-called 'all-channel experience'.

But that boat has sailed. The 'no channel' experience is coming.

The route to consumer interaction is now academic. The real value lies in the end-point outcome and the enrichment of value for the socially connected participants (whether human or otherwise).

We anticipate a near future where devices generate most of the global content, meaning that content creation will no longer be a key requirement for white-collar workers by 2020. Looking at recent statistics, this year connected devices will generate over 115 petabytes per month. This already exceeds the capacity of our global human population output many times over.

Our vending machine also can be made aware of its surroundings.

Advertisements on the Stockholm Metro interact with train arrivals and departures using commodity technology that is readily available at your local electronics store. Temperature and humidity can easily be read along with anticipation of the general sentiments of the local-based crowd. Increasingly, cognitive machines are becoming environmentally aware and can adapt their manner of interaction with a customer accordingly.

Humans and programmers may not need to apply. We've entered the second industrial revolution — that of socially enabled sensors, with robots that are aware, flexible, and self-learning. This emerging technology can operate at the fraction of a cost of white-collar annual salary.

From 'just-in-time' to 'options-before-time,' industrial machine intelligence will improve our lives. Our widely connected world will have machines and sensors as equal partners in social networking circles. Data will be generated in enormous quantities meaning current techniques for complex event processing, analytical intelligence, and simple context-specific visualization will need to develop rapidly. We need lightning-fast technology, sensors, and people to deliver perfectly timed social context.

How does one make friends quickly in this new world? To prepare for cyber-friendship, consider the following:

1. Think of any device as a potential sensor

Think about what you want it to 'learn' and what egosystems it can augment.

Can your phone predict or measure an earthquake? Individually maybe not, but connected arrays of phones and sensors can already bring insights via science, not possible in the previous decade.

What happens when my network breaks down and needs repair? Existing technology automatically can send messages to maintenance engineers of a jet engine or connected car before it breaks.

How can a machine help me stay healthy or keep me safe? Machines can already interact with your wearable technology to see how you're progressing towards your fitness goals. In the future this ecosystem will monitor and manage your health and safety with enhanced situational awareness.

2. Think about how to make the dialog with the consumer more intelligent

Even if you don't want to be identified by name, a device can recognize your age, gender, fingerprint, or mood with a remarkable level of accuracy. Machines can therefore start a sensible dialog with you from the outset. This interaction can be based on your immediate physical proximity to the machine, or can be digitally driven based on related events.

For example on your car journey home, Toyota Friend can remind you to commence the next overnight battery charge at exactly the right time.

Devices will be made more intelligent, connected, context-aware, talkative, and social in their own highly unique way. It's now the responsibility of humans to up our creativity to match them.

3. Think of the benefits of a smart, just-in-time ecosystem across your business

Current planned maintenance work orders the majority of replacement parts too early. If you could wait until just before it breaks, you would save money and protect the environment.

Imagine you're now able to friend daily objects of personal importance to make life easier. The trip to work could be so much easier if you could friend your local smart road so it socially guides your journey avoiding traffic, weather, and pollution hazards simply because it benefits you both.

Future product and service differentiation will require more than just human partnerships to compete. Brand success will be founded on our ability to harness the social power of man, machine, and sensors in new and innovative ways.

Friend these machines. They may not love you like humans do, but they're sure better in giving than in taking.

Now What? Make TechnoVision YOUR Tool!

Now What? Make TechnoVision Your Tool!

This contribution by
Pierre Hessler

So you took the time to read through TechnoVision 2015. Maybe you liked some of the graphics. Some views caught your fancy. Some headlines irked you. Overall, we hope a picture of our present and future technology emerged — an amazing one of radical change.

Now what? Forget it? Go to the next agenda item? Put it aside for a while? Look forward to the 2016 update? Wait for the future to just happen?

Here is our suggestion: Make TechnoVision your tool.

TechnoVision is a multi-purpose tool that you can use for (at least) five different purposes.

1. As a tool to LEARN

Each of the building blocks opens up learning avenues. Each describes a design principle or a trend in a few words — the place and direction to start digging, taking clues from the contributions and the suggested publications and papers. And the clusters provide the structure to organize learning — making it much easier.

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2. As a tool to COMMUNICATE

TechnoVision aims at clarity. Use it to discuss technology with your colleagues and partners. Making technology palatable and easy-to-understand to business has always been a major objective of Capgemini's successive TechnoVision series. Now that technology is an essential component of business thinking, business should be and will be eager to get the best understanding as early as possible — not to appreciate how to translate business into technology, but to grasp how technology creates business opportunities.

3. As a tool to DESIGN

Digital Transformation changes businesses in depth and breadth. Every function, every process, every plan is touched. The opportunities are too numerous to count — and they never stop changing. By way of contrast, standstill could well be fatal. Even more with classical information, the transformers need to know where they're going — what should my Digital Enterprise look like? As TechnoVision gives a broad view of the possibilities, combining immediate impacts with longer-term trends, it will help you design what you want to achieve.

4. As a tool to REPOSITION

Once your design is clear, the transformation task will look ominous. With so much on your plate already, how could you possibly add new endeavors, new projects?

TechnoVision will help you look at your efforts under way — and at your pipeline — and for each of them ask yourself: Is it "Design(ed) for Digital"? Is it at the right technical level? Does it tell the right individual and collective story? How future-proof is it? And maybe, most importantly: Does it bring me closer to the Digital Enterprise model?

With the answers to these questions, you can then reposition your transformational and technical projects, tune them, adjust them — adding this Big Data dimension, strengthening that aspect of mobility, linking with those touchpoints of the customer experience, giving it the first social dimension, introducing this new flexibility in the reengineered process. As a result, in addition to their original objectives, they will move you — in a modest way, in a good way, in a crucial way — towards your digital future.

5. As a tool to TRANSFORM

It will come as no surprise that in Digital Transformation projects, technology plays a significant role, provided technology is well-understood and well-mastered. We hope the TechnoVision tool will help you on both counts, so that your transformation is technologically inspired, technology-driven, and fun. Because don't forget: Technology has transformed our ways of living and working — sometimes with a little pain, but typically for our pleasure and enjoyment. Why not aim for the same in the Digital Transformation of our businesses?

As you make TechnoVision 2015 your tool, don't forget one of our crucial building blocks: End User, End Producer, and embrace it as your motto. We count on you to help improve what we have — and produce the next updates!

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About Capgemini

With more than 145,000 people in over 40 countries, Capgemini is one of the world's foremost providers of consulting, technology and outsourcing services. The Group reported 2014 global revenues of EUR 10.573 billion.

Together with its clients, Capgemini creates and delivers business and technology solutions that fit their needs and drive the results they want. 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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