ERIC SCHAEFFER

INDUSTRY X.0
REALIZING DIGITAL VALUE IN INDUSTRIAL SECTORS

Executive Excerpt
»With this inspiring book, Eric Schaeffer demonstrates the monumental impact that the Industrial Internet of Things has on the industrial sectors, and clearly shows how this can be harnessed for major competitive advantage, profit and growth.«

Cyril Perducat, Executive Vice President, Digital Services Transformation, Schneider Electric

»This groundbreaking book helps leaders and managers to thrive in the face of endless digital transformation. INDUSTRY X.0 is an inspirational call-to-action for everyone associated with the industrial sphere.«

Stefano Porcellini, Managing Director, Biesse Group

»The steady drumbeat of digital disruption has come to manufacturing in a way unequalled for decades. But where do you start? It’s one thing to know you will be disrupted, and another to join the disruption and outpace your attempted replacement. That’s where INDUSTRY X.0: REALIZING DIGITAL VALUE IN INDUSTRIAL SECTORS comes in – more than a warning shot, it’s a prescription – and a medicine every industrial leader should take. A must-read.«

Richard Mark Soley, PhD., Chairman and CEO, Object Management Group; Executive Director, Industrial Internet Consortium

»INDUSTRY X.0 comes at an opportune time, as science and technology unleash disruptive change across all fronts. It reveals how seismic shifts in industrial sectors will significantly improve customer outcomes. It is a practical how-to advice for companies to stay relevant in the new age of the Industrial Internet of Things. A thought-provoking book – meticulously researched and clearly explained.«

Mehran Gul, Project Lead, Digital Transformation Initiative, World Economic Forum
This executive excerpt is from the full and final book. Please note: It includes table of contents, preface, acknowledgments, introduction, chapter 8, an overview of the takeaways of each chapter and some information about Eric Schaeffer, the author. Please also note: The page numbering of this excerpt reflects the page numbering of the full and final book and it does not contain the sources of the footnotes. These are only included in the full and final book.
Industry X.0
Realizing Digital Value in Industrial Sectors
# Table of Contents

Preface ................................................................. 11

Acknowledgments ................................................... 15

Introduction ............................................................ 17
Beyond the Product: Outcomes and Value .......................... 17
Two Battlegrounds, Trapped Value and Six “No-Regrets” .......... 19
Fluidity and Data Pervasiveness Across the Enterprise ............... 21
Innovation in the New and in the Core – Finding the Right Pivot .. 23
Tying Together Products, Ecosystems and Platform Products ....... 24
How to Use This Book ............................................... 25
Too Much Will be Lost by Sitting on the Fence ....................... 27

PART I
The Industrial Internet of Things – Transforming Manufacturing Beyond Recognition .................... 29

Chapter 1

Industry’s Ongoing and Accelerating Digital Transformation .................. 31
The Drivers of Change in the Industrial Sphere ......................... 35
Technology Becomes Affordable and Puts Speed Behind the IIoT .......... 37
The Value of the IIoT is Still to be Unlocked .......................... 39
Ecosystems Form Powerful Wells of Innovation ....................... 40
The Product of Me vs. Mass Manufacturing .......................... 42
Liquid Fulfillment Networks Will Supplant Old-Style Factories ....... 43
The Critical Importance of Preparing the Digital Workforce .......... 45
The Surprisingly Slow Embrace of the IIoT by Business ................. 46
Takeaways .............................................................. 51
Chapter 2

How the IIoT Leads to the Outcome Economy ........................................ 53
New Tech Creates New Business Models ............................................. 56
Living Products or the Reinvention of the Product ................................. 58
Outcome Orientation Spurs Innovation in Products and Services .............. 60
Outcomes are Appearing Across Sectors ............................................. 62
The Why Behind the Buy ...................................................................... 64
From Rigid Business Silos to Agile Ecosystems ........................................ 65
New Risks and Rewards ...................................................................... 68
The Four Future Stages of Industry ....................................................... 70
Takeaways ........................................................................................... 76

Chapter 3

Digital Super Value – A Guiding Light for Digital Strategy ..................... 77
Two Speeds Create Massive Value Deposits ........................................... 82
The Societal Benefits ........................................................................ 83
What’s in it for Business? ................................................................... 87
Automotive – the Vanguard Efficiency Seekers ....................................... 90
How to Find the Right Pivots ............................................................... 97
Takeaways ........................................................................................... 100

PART II

How to Make the Most of the Digital Industrial Transformation ............... 101

Chapter 4

Six “No-Regret” Capabilities – the Journey Towards Digital, Mapped out Simply .......... 103
From Old World to New World on Many Different Paths ......................... 105
Chapter 7

Zoom in: How to Create a Connected Industrial Workforce 189

Mutuality Between Humans and Machines Across the Whole Enterprise 193
Low-Supervision Shop-Floor Machine-Centricity – It’s Nearly Here 194
The Path to Collaborative Robots Running Enterprises 196
A Fully Connected Workforce Needs New Organizational Structures 199
Connected Workers Must Iterate, Adapt, and be Flexible 201
Managerial Trust Issues Around Machines 204
Managers Must do More Strategic Judgment Work 206
Under-Ap preciated Intelligent Machines 208
Corporate HR’s Need for a Strategic Stance 209
Takeaways 212

Chapter 8

Zoom in: How to Master Innovation in the New 215

Old-Style Innovators See Only the Market’s Supply Side 219
“Build it and They Will Come” vs. “Let Them Come and We Will Build it” 220
The First Boosts From Innovation in the New 222
Four Innovator Types, One Long-Term Winner 223
Brilliant Innovators Lead the Way in the Industrial Sector 226
Digitally-Driven Innovation Makes all the Difference 229
Four Recommendations for Becoming a Reinventor 230
Incubator Mentalities and Capabilities Round off Future Innovation 233
Takeaways 238
Preface

The world has become digitally connected to the point of no return. Each day around five million devices become linked up with either each other, the Internet or both. There are around 6.4bn data-communicating objects in the world and by 2020 this number is forecast to explode to around 20bn.\(^1\) Our digital universe is in healthy expansion mode.

From this perspective, today’s device boom – the wristband pulse monitors, smart watches, satnavs and intelligent thermostats – are just the overture to a long and eventful journey towards lives digitally augmented, supported and enabled in ways unlike anything humans have ever experienced before.

The advance is propelled by our craving for technical innovation and our tendency to adapt promptly to new ways of interacting and engaging with machines and devices as soon as they exist. We as consumers will keep asking why this or that gap in the market has not yet been filled by some device or software solution. Businesses – the focus of this book, hence the title “Industry X.0” – and their increasingly digitally native workforce, used to a highly digitized private lifestyle, will put the same kinds of questions to their industrial vendors, displaying a new form of “industrial consumerism.”

At the core of this seismic upheaval sit Living Products, physical products reinvented as software-intelligent devices that act, think,
and are closely and constantly aligned with their users and ecosystems.

Clearly, then, the industrial sphere, the sphere of technologically produced physical objects, will play a major part in the seminal trip towards the planet’s digitization. Digital technologies will create a stage on which we as public, businesses and industry experts will pull off spectacular things in the coming years.

Consider the following: the first pharmacy staffed only by robots, is expected to open its doors in 2021; sensorized medical pills that report back to the makers when patients have swallowed them are currently in development; Siemens is already successfully running prototypes of completely unmanned, self-organizing and hyper-productive industrial plants; and raw materials giant Rio Tinto has huge mining operations based on automated trucks and drill systems provided by heavy equipment makers Caterpillar and Komatsu. Cars, industrial machinery and tooling, pumps, circuit breakers – they can all be rendered Living Products by adding software intelligence.

The ship has clearly sailed for digital sceptics, both as citizens and business leaders. The industrial enterprise world, comprising two thirds of the world’s gross domestic product, will be changed beyond recognition by digital technology, disrupting decades-old business habits, conventions and operating models. The ways in which labor works, machine-based processes are organized and information is shared will be turned on their heads. Strategic corporate thinking will be forced to incorporate completely new data-driven business models to secure a future for any enterprise. No wonder the US, Germany, China and Japan – all strongholds of successful industrial enterprises – have, with varying focus, put industrial digital transformation high on the agenda.
There is no turning back. What matters now is to make the most of the digital transformation. We have the opportunity to shape it. There is not one standard way to make it happen, the journey must be tailored to each enterprise individually.

That is why this book, unlike other publications, not only addresses the “why” of the industrial sphere’s wholesale digitization but also, primarily, the “how,” examining in detail the steps industrial businesses need to take to get the greatest positive effect and value from digital.

Packed with easily accessible actionable insights and suggestions, it should be a vital resource for industrial business leaders at all levels, C-suite and below as well as across all functions. It should help them discover, think through, adopt and implement the roadmap necessary for their enterprises to head out for the new territory, and act as an aide-memoire as the journey progresses.
In this book I have managed to gather and shape forward-looking advice around a complex subject: the emergence of the Industrial Internet of Things (IIoT) and its transformation of the industrial sectors. I visited and revisited the topic in detail and assessed its ramifications for the enterprises affected. And I developed a good deal of thought leadership in the process.

All this would have been impossible without the input of a large number of knowledgeable people from beyond our core book team. I was fortunate to be able to tap a wide intellectual catchment area: corporate thinkers, co-consultants, and clients, based in the US, UK, Germany, France, Italy, Korea, Europe, Japan, and China, contributing either broad ideas that helped shape the general themes and scope of the book or practical industry experience, focused sector insights, and firm opinion to test our own thinking. Their input has been invaluable in shaping the book’s observations, analyses and hypotheses.

To all of them I would like to express a sincere “Thank you.” The support of every one of you individually was a conditio sine qua non for pulling this off and collectively represents a piece of vanguard consultancy thinking on what is currently one of the most pressing subjects in the business world.

At Accenture I wish to thank David Abood, Fabian Bohn, Christophe Brasselet, Jean Cabanes, Brian Doyle, Dan Elron, Andreas
Acknowledgments


Special thanks must go to Sander van ‘t Noordende, Omar Abbosh, and Frank Riemensperger for their support, inspiration and thought leadership around the transformation of industries.

Within Accenture thanks are also owed to Georg Berger, Gemma Catchpole, Andreas Egetenmeyer, Sonja Fink, Ulf Henning, Fiona Morris and Matthias Wahrendorff, the closer team steering the publication, as well as to Jens Schadendorf, Titus Kroder, and John Moseley, who brought valuable experience and exceptional knowledge with regard to the writing and publishing of a book.

A big thank you also goes to Helen Kogan and Jenny Volich from Kogan Page, and Michael Wurster from Redline, as the publishers of this book, for their enduring commitment to and trust in this project.

Finally, and above all, I thank my wife Pascale for her patience, relentless support and love and my children William, Meryl and Edouard for the many and passionate discussions on the new digital economy. May this book help them navigate successfully through the change.
Introduction

Coinciding with the wholesale digital interlinking of society, the digital disruption and transformation of the industrial sphere is one of the world’s current megatrends, affecting companies representing two thirds of global GDP. Makers of cars, planes, trains, domestic appliances, heavy equipment and engineering technology, pharmaceuticals, and utility and raw materials businesses are all undergoing waves of technological upheaval as we speak.

Smartened, tightly connected, data-driven industrial products and processes are going to go mainstream in all advanced and many emerging countries very soon. Embedded in the wider trend towards the Internet of Things (IoT), its sub-segment, the Industrial Internet of Things (IIoT), will digitally orchestrate factory floors, physical products, workers and all enterprise functions and processes, unleashing enormous value potential.

Beyond the Product: Outcomes and Value

In only a few years time we will look back and call the two decades since the turn of the century the period of “the end of the product.” Ever more advanced digital technology will help to establish a new world in which customers will ask businesses for complex “outcomes” delivered by digital services around physical products instead of delivery of mere hardware.
The software “tissue” and data analytics that will eventually permeate the industrial sector will create a very distinctive new stage of economy. Enterprises will have departed from a conventional focus on manufacturing “dumb” low-margin products made for anonymous markets to forming very personalized relationships with their customers, driven by the latter’s instantaneous demand for “switched-on,” software-connected, and eventually even Living Products and Living Services with huge value potential. Digital technology will also enable providers of outcomes to monitor the shape of outcomes and usage patterns in the field.

In the churn of this megatrend, the terms B2B and B2C will start to blur. In fact it will be one of the defining fascinations of the industrial sector’s digitization that enterprises used to dealing with business clients will suddenly be forced to think like consumer-facing businesses as part of the trend known as “industrial consumerism.” This means, that, for not only consumer goods companies but B2B industrial companies too, final outcome experience and service quality will now be the top criteria for success or failure – and eventually the only significant source of corporate value in this sector.

This is driven by a shift in customer attitudes and, as such, is a clear rebuke to the common assumption in government that it is businesses that will drive the broad-based trend towards digitization. What we currently see is the opposite: the urge for change clearly stems from the demand not the supply side.

It is the phenomenon of industrial consumerism and the emergence of Living Products that are driving the change. In that regard many governments are too focused on creating the right environment for digitizing the shop floor, not realizing that this is not the right starting point for enterprises to arrive at the necessary new business models.
In only a short while we will be accustomed to markets in which tried-and-tested industrial hardware products will become permanently reconfigurable software containers, eclipsed in profitability by their own new service qualities.

This will have dramatic effects for businesses and how they go about managing their products. This will be when companies immerse themselves in ecosystems and alliances with what today would seem unlikely partners – another seismic shift for most of today’s industrial organizations.

It will therefore be paramount for industrial companies to master this radical transition successfully, opening themselves to a journey that will change their operating models, ways of working and organization beyond recognition – the alternative being a catastrophic loss of market clout and profitability.

This is why this book’s aim is to familiarize business leaders from the industrial sectors with the key competencies necessary to tackle all this – competencies such as creating unified Product Lifecycle Management (PLM), embedding software and connectivity in products and services, using analytics to drive value and growth, creating closed-loop agility in development and manufacturing, selling “as a service” and orchestrating the digital and industrial ecosystem, to name but a few.

**Two Battlegrounds, Trapped Value and Six “No-Regrets”**

From the perspective of industrial enterprises, digital disruption will have two major battlegrounds. On the one hand, it will be about leveraging new digital technologies to bolster internal efficiency throughout all functions, as only this will fund expansion into current and future markets around Living Products. Buried value can
be found plentifully, especially in legacy industrial businesses, and
digital technology can typically bring it to light for investment into
the future.

On the other hand, digitization will challenge businesses to work out how Living Products with a smart software lifeblood can make a market, how an advanced, technology-driven and value-creating digital customer relationship could look, and how it can be embedded into new and unaccustomed outcome models.

Both fields currently probably appear to many business leaders like giant construction sites with no horizon, with works in constant progress because the technologies deployed are incessantly evolving. Which one should one pick, when and along which roadmap? This sort of disorientation might even repel enterprises and their executives to the point of postponing work or even giving up completely on attempting a future-proof digital strategy.

Certainly at the moment, the progress of IIoT adoption is sluggish. Research conducted for the World Economic Forum showed 72 percent of the C-level executives interviewed were convinced that the IIoT would fundamentally change their industry, but just 20 percent had a thought-through strategy for harnessing it.²

The dizzying vortex is not just because of digital technology’s swift advances. It is also the ever-complicating mix of numerous underlying technologies such as sensors, cloud computing, processing power, business intelligence algorithms, robots, artificial intelligence, cognitive computing and big data.

The decision to give this book the title “Industry X.0” was born not least from the awareness that technology now is in such dynamic flux that its staging posts can no longer be pinned down for longer than a moment. Industry 4.0 will turn swiftly to 5.0, to 6.0, and counting.
Still, in the middle of this raging tech storm there exists a bedrock foundation of digital models, mantras and measures that will create immediate value in any industrial enterprise. A company that adopts them and makes them work adequately will be steering the right digital course regardless of what the future holds and which trajectories digital technology takes.

This is the upside of the current technology frenzy, the opportunity for “unconventional” growth, the chance for industrial businesses that execute their digital strategy right to reap unheard-of speeds of profitable expansion. I think there is every reason to believe the landslide successes of digitally driven businesses such as Amazon or Facebook can be replicated in the industrial sphere.

Those software-only platforms can be a role model for many industrial products. Not all products can be transformed into platforms, but certainly sooner or later every industrial product will be integrated into another product that operates as a platform.

To be as helpful as possible to industrial practitioners, this book is therefore built around a set of fundamental digital “no-regret” capabilities every company should implement and use as a launch pad for digitization. They form the basis for a detailed, strategic tour d’horizon showing what the industrial sector will face over the coming years and how to harness it.

**Fluidity and Data Pervasiveness Across the Enterprise**

Often referred to as the “fourth industrial revolution,” and better framed as “Industry X.0,” the digital transformation of industrial companies has profound ramifications for businesses’ cost structure, their work process design, the involvement of human labor and, crucially, the shaping of products and services.
Introduction

Digitization is not – by far – only just about the progressive automation of existing manufacturing facilities and shop floors. Casting the net much wider, it entails completely new digital set-ups across all business functions and the creation of holistic new operating models around software-enabled connected products.

Thus, internally, enterprise digitization covers any process or operation that does not involve direct consumer interaction – areas such as idea generation, testing and prototyping, or R&D, with the management of customer, supplier and partner relationships also crucially defined by the new digital ways of steering industrial production.

Externally, business digitization means hunting for propositions that customers find attractive because they offer excellent software-induced efficiency or convenience, fulfill an outcome or create good value for their own business.

Creating agility and acceleration of processes is hence among the top three commandments for a solid digital strategy. Industrial businesses’ product and service development units must be enabled to react in real-time to changes in the market. And in a demand-driven economy, they must be able to hyperpersonalize a product or service in a short timeframe, down to a lot of just one.

This radical shift is only achievable when, among other measures, siloed units within the enterprise are broken up and unhindered information loops are established to connect designers with engineers with marketers with customers with suppliers with boardrooms. An absolute maximum of data pervasiveness but also much more decentralized decision-making processes based on local data analysis will define the well digitized organizations of the future.
Innovation in the New and in the Core – Finding the Right Pivot

Importantly, a dual innovation approach will usually be needed. Most industrial companies still run very profitable legacy product or service lines that need to be maintained while applying gradual innovation steps. In a completely separate strand, a second innovation engine for thinking “outside the box” must be kick-started to come up with new and visionary data-based customer propositions unrelated to the old world. This is going to require some extra human and financial resources.

What this implies – applying ingenuity at different speeds and looking at different technological horizons within one business – is certainly not easy to achieve, but it is a necessity for success in a hyper-connected corporate future. Eventually and over time both innovation streams will need to be led to new and future-proofed business models.

What customers want and expect, are no longer just bigger, better, faster or smaller products and services. Rather it is ideally up to industrial businesses to anticipate through their intimate digital customer relationships what their customers and the customers of their customers require. The “why behind the buy” has to be understood and this requires a new, demand-driven approach to innovation, one open to external input from extended ecosystems and banking heavily on digital feedback loops with the end-user market.

The trends described will also have a massive impact on the way the whole product value chain and product engineers, factory staff and field agents work. From their perspective, incorporating and blending with intelligent machinery and software tools will be the birth of the connected industrial workforce.
Introduction

Digital technology will augment employees in all functions across a business. Shop-floor employees will eventually cooperate with semi-autonomous machines at very close distance in a state of mutual understanding. They will wear data-collecting devices such as smart glasses or helmets, augmenting their skills to achieve much better productivity. Product engineers will be supported by artificial intelligence (AI) driven software and generative designs. AI will even take a seat in the boardroom, supporting strategic management decisions.

This new work style and work environment will require new training and re-skilling. This holds true for blue- and white-collar workers, managers and executives. Overall, enterprises will have to prepare by adopting a more active role in training, developing and preparing existing staff for the digital age or else suffer a significant skills shortage.

Tying Together Products, Ecosystems and Platform Products

Finally, the IIoT requires that input from customers, subcontractors, partners and suppliers be channelled to continually influence strategy throughout a product’s lifecycle. Leveraging allied ecosystem parties is therefore becoming critical to arrive at satisfactory time-to-capability, agility-to-assemble and speed-to-market. And on top of that it will also blur traditional industry boundaries.

Building an ecosystem is a skilful task, requiring business leaders to think laterally, factoring in wide horizons of possible allies and unusual business cases and opportunities. This is a drastic departure from old-style product-focused manufacturing, but is still rewarding and will create enormous value.
Against this ecosystem backdrop, many industrial products will be shaped to become platforms. The trailblazers here are the likes of Apple and Google. Both businesses created an ecosystem-style developer community around their smartphone operating systems as platforms. External app creators are the ones imbuing otherwise “dumb” smartphones with value – to the mutual benefit of all: the developer, the platform owner and the customer. Again, there is no reason to assume that industrial companies cannot replicate a similarly stellar success around mining trucks, jet engines or home technology such as lighting, security or heating systems – though surely not all industrial products can turn into platform products.

**How to Use This Book**

As is probably already clear, the huge changes digitization is set to bring about in manufacturing can be as bewildering as they are fascinating. This book has been written to be your guide to this new territory. The landscape is wildly complex, but, if you know how to read them, its multitude of features provide compelling pointers for the future.

Think of this, then, as something to be used – a usage manual, if you like, for the Industrial Internet of Things (IIoT). While it may serve as a general-interest primer, it is aimed mainly at those who will be actively implementing the change. It provides a clear delineation of the challenges and opportunities, and invaluable guidelines on drawing up the right digitization roadmap for your organization. Not all routes will be the same.

And just as there is no fixed path towards the digitized industrial future, there is no one route through this book. Read it in order, or zero in on particular areas as you require. In this, you can be guided by this section.
Introduction

Be aware that each chapter can be read independently and that what is discussed in them is illustrated by company cases and with the key takeaways.

Part I, comprising Chapters 1-3, is your introductory overview of the IIoT transformation, designed to help you orient yourself in the new world. Chapter 1 gives the current big picture. I look at the flurry of massively disruptive new technologies converging to create the IIoT and explain how the result will be an entirely unprecedented paradigm of manufacturing in which businesses will operate in highly unfamiliar ways. Chapter 2 shows where we’re headed, explaining how the IIoT will inevitably lead to a new kind of economy, the Outcome Economy. Chapter 3 discusses the enormous value to be gained from digitization of industry.

Part II, comprising Chapters 4-9, is a series of detailed looks at the key areas a digitization strategy will need to encompass. Chapter 4 gets you started on your path towards digitization. It introduces six “no-regret” capabilities – digitally-based changes you can make now that are certain to deliver results. Chapter 5 looks at big (and ever-increasing) data, probably the single most powerful value driver in the Industry X.0 – as long as you get your data analytics right. Chapter 6 takes you through digital product development, discussing the importance of strengthening software capabilities, synchronizing software and hardware clocks, and of having a robust Digital Product Lifecycle Management (DPLM). Chapter 7 highlights the challenges of managing the human workforce in the era of robotization and artificial intelligence. Chapter 8 is your guide to innovation in the radical new world of the IIoT, describing the four main innovator types and explaining why only one can really thrive in the Outcome Economy. Chapter 9 explains how in the IIoT’s porous, interconnected world, you will need to become part of an ecosystem and may well benefit from building a platform.
Part III, Chapter 10 is a look further into the future, to 2030 and beyond, at a magical, ultra-fluid world in which products can change shape and the Outcome Economy gives way to the Pull Economy.

At the end of the book you will find all the chapter takeaways – that provide a quick and easy access to the actions needed to be taken to digitize your business –, a glossary of terms and an index.

Too Much Will be Lost by Sitting on the Fence

Arguing the case for digitization in the face of scepticism from staff, investors and business partners may take ingenuity, courage, stamina and lots of skills in change management on the part of executives and business leaders. It is all worth it and there is no alternative.

The ground is shifting, but the industrial world’s rapid digital transformation should not to be seen as a threat. It is a major opportunity for value creation, not to mention for an incredibly dynamic and stimulating work environment. Industrial companies should seize it rather than wait and see – or risk becoming a digital laggard, resulting in low margins, weak innovation power, slow profits and even disappearance from the market.

There is, contrastingly, little to fear from making a start at digitization if you take the right approach. You can and in fact should start small, scaling swiftly only if your initiative proves successful. That is the beauty of the digital era.
Zoom in: How to Master Innovation in the New

What customers want and expect from businesses are no longer just bigger, better, faster or even smaller products and services. Businesses must be much more accurate in anticipating what customers require, even before the customers sense it themselves. That requires a new demand-driven approach to innovation, one without barriers and boundaries in enterprise organizations, that is agile and open to external input from extended ecosystems and pays close attention to digital feedback loops from the end-user market. Four types of innovators are currently identifiable in global business practice. Only one, the Brilliant Innovator, well-prepared to drive business value in the New, is qualified to be sustainably successful in the near future when the Outcome Economy becomes the norm.
For the best part of modern industrial history, innovation pushes of incumbent manufacturing sectors’ innovation pushes have focused on additional functionalities or qualities for existing products. Car technology, for example, has been pushed towards ever more horsepower, fuel efficiency, and safety, while the car’s digital experience was neglected.

The routine task of development engineers and designers was thinking up new features or product generations that would make physical hardware items saleable in high volume to increasingly refined market niches. Innovative progress was incremental not revolutionary.

But innovation pushes of this sort have yielded fewer and fewer “major steps” over the last century. Where the 1940s, 1950s and 1960s saw the heydays of breakthrough innovations such as semiconductors, supersonic flight or advanced radar technology, in later years the pace and number of breakthroughs steadily slowed.

This is to a certain extent even true for quantum leap innovations such as the smartphone. Its inception, disruptive as it seemed about ten years ago, had on the one hand the character of a mere technological extension. Data-enabled mobile phones had been around for years before an Internet-enabled mobile device with a large touch screen became the staple gadget of today’s digitally connected world.

But this is the point: the smartphone is a real breakthrough innovation, but it is so in being a platform product, embedded in its own ecosystem of software applications and application creators. Here, software, experience and the platform that enable them are what create the value of what is actually a rather “dumb” piece of microelectronics. And this sets the direction for future breakthroughs.
The wider problem with this in the swiftly emerging digital world is that many incumbent enterprises’ R&D units and activities are often stuck in a legacy rut – compartmentalized in silos and heavily focused on legacy products and services. Many of them also make hardly any effort to embed any analytics capability within a state-of-the-art platform approach. This makes most of them unprepared to challenge digital disruption.

Yes, many companies are making good progress in creating e-commerce portals or managing their customer relationships digitally. But their R&D departments remain insular, without wider integrated analytics capabilities or platforming approaches with smart links to the Internet of Things (IoT) outside their own walls.

Their set of innovation tasks is about to become much more complex. On the one hand they will need to fire up innovation in legacy activities that still earn good money and which will do so for a while. On the other, they must push innovation in the New, giving shape to connected products and services of a totally new character, compatible with the approaching outcome I have been describing. A bifurcated approach is necessary to cover these two strands.

Studies found that many companies struggle to master such bifurcation. Around a thousand of the world’s largest companies spent $650bn on research and development in 2014 according to their survey – an increase of over 6 percent per year over the last five years. Enough funding is dedicated to innovation, it seems. What matters is less how much than how it is allocated.¹

Although 63 percent of companies we surveyed have a Chief Innovation Officer, 26 percent still have no formal or no system at all in place to achieve innovation, let alone divide it strategically into two strands.²
Bear in mind that an innovation system, in the old as well as in the New, is a complex set-up comprising an effective idea engine, ecosystem scouting, talent and governance. It is not easy to get started, never mind splitting it in two.

**Old-Style Innovators See Only the Market’s Supply Side**

Incumbent companies, sizable as they are, need to adopt the capabilities and pioneering mindsets of small start-up incubators or they will systematically consume their own competitive edge.

The prevailing mindset among their innovator teams is still: “What can we do to get buyers to like what we already have by tweaking the offering?” This is indeed what innovators for existing products and services still in demand should continue asking themselves. Innovators in the New, however, should also ask: “What can we do to disrupt – to give clients what they don’t yet know they want?”

Too much research and development activity is still locked into only the first question. Here, an “inside out” view of the world prevails instead of a more multidimensional picture comprising connected cross-industry inputs and joint cross-industry outputs – for instance in the form of new development alliances and profit-sharing partnerships. Similarly, there are often no cross-functional strategies to integrate innovators with IT and solution product managers within companies.

Old-school innovation approaches are still firmly built on a fundamental supply-side perspective. They focus on end-user markets, too often anticipating future market volumes through demographic research, assessing acceptability of a product with focus groups and estimates of potential sales figures before deciding whether to
go ahead with marketing. “Build it and they will come,” is a mantra still heard often.

In practice, of course, markets sometimes reject what engineers and marketers were sure would be a killer offering and propositions that tested less well at times achieve stellar market reception. The history of innovation is littered with spectacular misjudgements. Think of the famous prediction by 20th Century Fox luminary Darryl F. Zanuck: “Television won’t be able to hold on to any market share it captures after the first six months. People will soon get tired of staring at a plywood box every night.”³ Or there’s the prognosis that “Nuclear-powered vacuum cleaners will probably be a reality within ten years,” from an American domestic appliances manufacturer in the 1950s.⁴

“Build it and They Will Come” vs. “Let Them Come and We Will Build it”

The orientation towards the market’s supply side is no longer state-of-the-art. The data-driven Outcome Economy will significantly move the goal posts for new propositions.

In the future, nimble, open, demand-driven innovation will be the norm and customers will be offered new and fluid service experiences. Innovators will be in demand who can anticipate and meet these fast and frequently changing market needs in near real-time, using information gleaned from sources such as social listening. Each consumer or client will be his or her own very individual consumer group, able to indulge a taste for luxury in the morning and frugality at night or largesse in the car but thrift at home. The world will be that agile.

As I stated earlier (Chapter 2), the future will be defined by sales of outcomes. Companies will offer services and experiences around a
physical software-enabled product instead of the product itself, which will primarily function as a mere container.

Power drill manufacturers – or for that matter any service provider in possession of a drill – will sell the outcome of holes in the wall, complete with a plug and hook to put up the picture, rather than just a power tool. A builder of forklift trucks will offer software for steering the whole truck fleet in warehouses to meet customer demand for maximum logistical efficiency. And carmakers will sell safe trips provided by autonomous cars and in-car services such as software that makes the car a seamless extension of the office.

To succeed in this world in which future markets crucially hinge on software and the innovation of digital experiences, companies must evolve their innovation DNA. They must keep in mind that the world will soon be dotted with millions of products smartened by digital code enabling copious data flow from products back to development engineers at innovation units. Analyzed, rehashed and refined insights will be their major raw material, feeding into their ideation processes for new products and services.

The data loopback described is decisive as it imposes a demand-driven momentum on enterprises. Product and service clients in the field will act as “permanent beta” reporters and feedbackers for corporate research and development teams. “Build it and they will come,” will turn into “Let them come and we will build it.”

Achieving this will require drastic changes in mindsets and innovation processes. This cuts across all operations and collaborations with customers and partners. It equally requires a new lens on competitors and the ability to operate in more open and fluid ecosystems.
Success in data-driven markets rests on leveraging data insights. But it is also based on the feedback intelligence of the crowd, the ability to master multiple development lifecycles simultaneously, the implementation of digital platform technology and partnering with outside innovators. In the end, all this is in the name of product and service solutions oriented around precise customer needs.

The First Boosts From Innovation in the New

Innovation priorities have noticeably begun to shift, and not just in digitally intensive markets such as telecommunications, consumer electronics or software. Businesses across many sectors, including industrial engineering, are slowly beginning to rewrite their innovation playbooks.

Recent global research across industries found that 42 percent of companies say improved customer experience is where they’ve seen the greatest success from innovation in the last two years – pointing to a growing understanding of the Outcome Economy. The research also shows that leading enterprises are starting to look beyond simply differentiating legacy products and services, making preparations to create increasingly complex customer solutions with higher value and enhanced experiences. The table in Figure 8.1 indicates who is at the forefront with what approach.

The businesses studied are seeing promising results from their innovations. Business leaders, depending on how much emphasis they put on new ways to innovate, report between 3.5 and 7 percent higher revenues and profitability, directly attributable to new and better innovation approaches.

The extent of those higher revenues is shown in Figure 8.2, with industrial equipment, consumer goods and consumer electronics sectors profiting most from new ways to innovate.
Figure 8.1 – Re-Engineering Innovation to Change the Overall Customer Experience

<table>
<thead>
<tr>
<th>Company</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monsanto</td>
<td>Monsanto is offering targeted intelligence to farmers in real-time, helping them maximize yields in any weather and soil condition. The offering also feeds back to Monsanto by using the weather and yield data to develop better farming products so they can offer a more personalized experience to farmers.</td>
</tr>
<tr>
<td>Disney</td>
<td>Disney created the “Magic Band” to provide customers with an optimized and seamless experience throughout their time at Disney World, while providing a valuable source of customer insights.</td>
</tr>
<tr>
<td>John Deere</td>
<td>John Deere transformed its business by moving beyond pure equipment to providing farmers with digital services such as crop advisories, weather alerts, planting prescriptions and seeding population advice.</td>
</tr>
<tr>
<td>Dow Chemical</td>
<td>Dow operationalized collaborations with customers/partners in its value chain through its “Pack Center” facilities: cutting-edge testing labs and technical teams that more closely align it with customer needs and wants.</td>
</tr>
<tr>
<td>Lego</td>
<td>Lego, far from being just a manufacturer of plastic components, is today, at its core, a design firm, engaged in conceiving experiences that extend physical play into virtual and digital worlds. To bolster its design capabilities, the company now collaborates with retailers, academics, and technology inventors.</td>
</tr>
<tr>
<td>BMW</td>
<td>Auto giant BMW generates deep end-customer insights through its customer-oriented sales and production process (COSP), an online ordering system that enables customers to personalize their vehicle orders up to eight working days before assembly begins, with no impact on delivery deadlines. COSP records and processes nearly 120,000 modification requests a month and feeds directly into the manufacturing planning department. The system not only enables near real-time adjustments to production schedules but also gives BMW more immediate and accurate insights into how customers’ preferences, needs, and tastes are shifting.</td>
</tr>
<tr>
<td>Xiaomi</td>
<td>Crowdsourcing development of mobile phone features allows China’s Xiaomi to bypass traditional R&amp;D spend.</td>
</tr>
<tr>
<td>Honda</td>
<td>Honda invested in rapid prototyping to accelerate product introduction and seek feedback on design(s).</td>
</tr>
</tbody>
</table>

**Four Innovator Types, One Long-Term Winner**

Studies also analyzed the practices and value performances of 350 businesses from eight industries: automotive, industrial equipment, consumer goods, medical devices, enterprise technology, consumer technology, communications technology and software. To get a global spread, we further looked into nine countries – the US, Canada, the UK, France, Germany, Italy, China, Japan, and South Korea – where we interviewed chief technology officers, division presidents and division vice presidents of engineering and innovation, or holders of equivalent roles.
Filtering down our findings, we were able to extract four innovator types, each with a characteristic approach to tackling the New (see Figure 8.3).

The first, and most common at 43 percent, we called the **Market Share Protector**. This describes a business basically following the old innovation rulebook, spending on research and development fairly moderately, just enough to come up with enough product and service innovations to defend a *status quo* market share. The bulk of innovation is conducted in the legacy strands of products and services.
The second type we dubbed the **Efficient Executor**. This is an enterprise with significantly more innovation efficiency thanks to a much more stringent policy towards streamlining innovation processes. But, surprisingly, this does not translate into higher innovation returns, as this type has not yet arrived at new-style innovation set-ups involving all the ingredients we have been discussing – from connected products and platform designs to alliances with outside ecosystem partners.

Increased returns were realized by the third type, the **Early Innovator**. This is a business with agile and responsive start-up-style innovation processes, leading to breakthrough innovations resulting from a “light-bulb moment.” Such innovations are sufficient to change whole markets or carve out completely new market segments and the businesses are duly able to keep their pioneer returns going for a good while. Thus, their return and efficiency are significantly higher than the first two innovator types.
Brilliant Innovators Lead the Way in the Industrial Sector

In the same higher-return bracket is a fourth innovator type, which we see as the role model for modern industrial manufacturers in the Outcome Economy.

This is the Brilliant Innovator. It combines the Efficient Executor’s systematic innovation efficiency with the Early Innovator’s innovative power and resulting return levels. The social media platform Facebook is a good example, having made the journey from Early Innovator to Brilliant Innovator, with a real talent for creating solutions around customer experiences.

Industrial business are now also aspiring to become Brilliant Innovators. German engineering firm Bosch has, for instance, launched its own IoT cloud for web-based services. In it Bosch runs applications for its connected mobility, connected industries and connected buildings businesses – with the stated aim of entering completely new fields and customers. Thus the IoT cloud provides a huge variety of connected services that range from enabling consumers to reserve parking spots prior to arriving at their destinations, to remote troubleshooting for heating engineers, and to providing farmers with exact understanding of ground temperatures in order to improve harvest and yield.9

Health technology specialist Carestream is similarly expanding its digital value proposition well beyond centralized clinical imaging departments, making its imaging and informatics solutions available to areas such as orthopedics, intensive care, emergency department, intraoperative and bedside imaging. And the company uses its technologies to create wider healthcare collaboration and information-sharing capabilities.10
Microchip maker Intel is also spurring the development of new products that use its chips to expand the market for semiconductors. Thus it has entered the drones business through a series of acquisitions and continues to invest in drone technologies. Intel acquired Ascending Technologies in 2016 following its $60m purchase of Shanghai-based drone and aerospace company Yuneec International. It has also made investments in other drone companies, namely Airware and Precision Hawk.11

All these businesses recognize the need to move to the upper right quadrant in our innovator chart because new digital business lines are an imperative for survival in the future.

I recommend that all manufacturing companies aim to become Brilliant Innovators. Early Innovators obviously do well, but there is probably no way to engineer this position with certainty, given that it is based on lightbulb inspiration moments. It is also impractical for existing large manufacturers with still successful legacy products. Finally, as Facebook shows, for really sustainable success, even Early Innovators should probably aim to become Brilliant Innovators too.

The Brilliant Innovator pole position can only be achieved when the full-spectrum new innovation culture I have outlined is implemented throughout the organization: no silos, free data flow, effective feedback loops, connected products, and real-time reaction to market shifts and customer attitudes.

As Figure 8.3 shows, we found that 43 percent of businesses are Market Share Protectors and 37 percent are Efficient Executors. So a full 80 percent of businesses across all sectors are still running innovation units that do not use the playbook for innovation in the New. In that, they are mere Renovators.

Brilliant Innovators represent only 13 percent of companies we studied and the Early Innovators are even rarer at only 7 percent,
which, again, can probably be explained by the fact that game-changing innovations per se are rare and often the outcome not of systematic R&D activity but ad hoc ingenuity. (As an aside, very few industrial manufacturers on the list score really high in this type of innovation, but one that does is 3M.) The select few Early Innovators and Brilliant Innovators are high performers, true Reinventors, enjoying greater return on investment and market share than their peers.

Perhaps surprisingly, our findings also show that these higher returns do not necessarily come from greater financial investment in innovation. The results rather illustrate that all innovator types have more or less the same innovation investment profiles. What makes the difference is the Reinventors’ better knowledge of efficient innovation approaches and how to leverage them. This is why true Reinventors simply generate significantly higher results from the same investment: 3.5-7 percent annualized revenue lift and a corresponding growth in operating income compared to their industry peers.
Figure 8.5 – Innovation Investment Allocation

<table>
<thead>
<tr>
<th>Reinventors</th>
<th>Transformational/ Growth</th>
<th>Incremental/ Sustaining</th>
<th>Adjacent/ Platform</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>32%</td>
<td>37%</td>
<td>31%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Renovators</th>
<th>Transformational/ Growth</th>
<th>Incremental/ Sustaining</th>
<th>Adjacent/ Platform</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>32%</td>
<td>35%</td>
<td>33%</td>
</tr>
</tbody>
</table>

**Digitally-Driven Innovation Makes all the Difference**

We asked our sample businesses to rank the procedures, methods and approaches they use in their innovation activity. Unsurprisingly, the list for Reinventors looks significantly different from the one for Renovators (see Figure 8.6).

**Figure 8.6 – Customer/Consumer Insight Methods**

<table>
<thead>
<tr>
<th>Reinventors Top 5</th>
<th>Renovators Top 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Insights from Crowdsourcing or External User Data</td>
<td>1. Trend Monitoring and Forecasting</td>
</tr>
<tr>
<td>2. Online Research Tool</td>
<td>2. Tailoring to Global Markets</td>
</tr>
<tr>
<td>3. Ethnographic Research</td>
<td>3. Big Data Mining</td>
</tr>
<tr>
<td>4. Social Media Listening and Integration</td>
<td>4. Channel Insights (Distributors, Retailers)</td>
</tr>
<tr>
<td>5. Channel Insights (Distributors, Retailers)</td>
<td>5. Competitor Insights</td>
</tr>
</tbody>
</table>

“Using Insights from crowdsourcing or external user data,” for instance, ranked number one in the Reinventor list, indicating permeable structures, agile processes, flexible docking options for external innovation partners and quickly built ecosystem links. The use of online research tools and social media listening are also crucial when it comes to exploiting the full advantages of creating digital consumer experience.

One can see that Renovators are hardly digital luddites since they use big data mining and channel insights. However, their number
one tool, trend monitoring and forecasting, strongly points at traditional supply-side market views and a largely conventional innovation set-up. Essentially, they take a well-trodden innovation path centered around more and improved product features.

Reinventors accelerate faster to outsized returns from their innovation and R&D capabilities. Brilliant Innovators are especially gifted at finding new ways to connect with customers through cutting-edge innovation processes, platforms and ecosystems in which the product or service is just one dimension of a much larger value proposition.

You can see in Figure 8.7 that it works. Our research found Reinventors significantly superior in all criteria for financial success in an Outcome Economy: time to market, rate of product introduction, creating digital customer experiences, spotting relevant trends.

**Figure 8.7 – Innovation Capabilities Leveraged**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Reinventors</th>
<th>Renovators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achieving Higher Product Introduction</td>
<td>34%</td>
<td>12%</td>
</tr>
<tr>
<td>Being Faster to Market</td>
<td>58%</td>
<td>18%</td>
</tr>
<tr>
<td>Identifying Insightful Customer/Market Trends</td>
<td>52%</td>
<td>16%</td>
</tr>
<tr>
<td>Incorporating Digital as Part of the Customer Experience</td>
<td>53%</td>
<td>21%</td>
</tr>
</tbody>
</table>

**Four Recommendations for Becoming a Reinventor**

Making the move from one quadrant to another, with the aim of ending up a Reinventor, companies must implement innovation models resting on four main pillars:
1. **Build an insight platform.** This creates new revenue through continuously renewing combinations of products, services and experiences that dynamically change and adapt.

Knowing your customers and consumers has always been vital, but in this multi-dimensional landscape of balanced products, services and experiences, you can no longer just ask customers what they want, you must meet their as yet unmet and possible even yet appreciated needs. This becomes more important the more customers are redefined not as a monolithic group but as individuals of one. See again in the following table (Figure 8.8) who is already leading here.

Such understanding is the lifeblood of the Brilliant Innovators. Accordingly, our study shows that 63 percent of leaders are today making improvements to their advanced analytics and other methods listed in Figure 8.6 to better understand the customer and 31 percent have plans to do the same in the short term.

2. **Be solution-centric.** The new competitive world is multi-dimensional. While businesses clearly must continue improving and augmenting existing products and services, they must also focus broadly and deeply on the ecosystem of experiences and connections they support and provide. Services, experiences, hardware and software should all be connected and centered around the customer.

That requires a major realignment. Business silos must cease to exist; R&D, engineering, manufacturing, supply chain, sales and marketing are all equally accountable for innovation and must pursue it collaboratively and in alignment. Existing walls between different product lines must be torn down so offerings can start to complement each other and give customers bigger value and better experience. A shift in mindset is required where implications for innovation-driven growth are no longer linear but continuous, dynamic and agile.
Company Description

Verizon: Verizon is aiming to drive new revenue using subscriber data, based on omni-channel consumer mobile marketing behavior from connected devices across a nationwide mobile network.

Caterpillar: Caterpillar formed a partnership with Uptake to provide predictive analytics on equipment health based on onboard telematics data. This resulted in increased asset productivity for customers.

Rolls-Royce: Rolls-Royce uses sensors and predictive analytics to monitor its jet engines and make recommendations to its customers on maintenance to increase uptime and reduce total cost of ownership.

Netflix: Netflix used insights from customer viewing habits to predict the potential market size for its House of Cards show and that Kevin Spacey and David Fincher would likely be a successful star and director.

Pitney Bowes: Pitney Bowes’ Single Customer View software solution helps organizations enhance and deepen their understanding of customers in the digital era. Single Customer View allows to rapidly design, deliver, and evolve contextually-relevant views about a customer in real-time across all channels.

Cedar Sinai: Cedar Sinai has enabled HealthKit integration in its hospital to aggregate data from over 80,000 patients using over 900 Healthkit-enabled apps and devices. Cedar Sinai’s initiative will help doctors deliver better healthcare with increased visibility into their patients’ health data. In addition, it will reduce treatment time for patients with better localization of their healthcare data.

CPG companies: CPG companies are now incorporating real-time retailer sales data into their forecasts, allowing them increased agility in response to market changes while better optimizing inventories (demand sensing, but not demand insight).

3. Drive pivotal leadership. This is leadership that orchestrates, activates and influences enterprise-wide change. It requires leaders at the helm capable of seeing value where others can’t, setting the right course and charting progress. Good technology companies employ solution managers as pivotal leaders, where other sectors use relatively traditional product or brand managers more focused on incremental sales than breakthrough solutions.

Our survey points to two clear characteristics that Reinventors get right. They set the adequate vision and they establish the metrics by which success can be assessed and monitored. What’s more, our survey also confirms that they prioritize key areas above others,
putting emphasis on, strategy-driven product management, leadership vision and program execution.

4. **Operate at multiple speeds.** Benchmarks of success in the new innovation playbooks cannot be the same performance indicators as used in the past and time to market, in particular, is no longer a source of long-term differentiation because everybody will be reacting incredibly fast to market cues. Reinventors understand the need to operate at multiple speeds simultaneously, reflecting the different requirements of digital and traditional product and service innovation cycles.

The results finally show that Reinventors continue to permanently develop distinctive and dynamic innovation approaches and capabilities. In other words, they’re constantly rewriting their innovation playbook. It is a process well reflected in the following table.

**Incubator Mentalities and Capabilities Round off Future Innovation**

As we have seen, large companies, feeling the heat, are starting to inch closer to new and speedier innovation mindsets. Where typical innovation cycles in pre-digital and product-centric times ranged up to seven years, now it is often down to only two or three years and in many cases only months.

Still, to shift from traditional, static and anticipatory innovation models to agile incubator capabilities, gaining the responsive innovation brain and muscle of a start-up, is a challenge, particularly given the need for a bifurcated approach between legacy offerings and the New.

Incubator services, offered by a company-owned team of innovation experts looking into all processes across all functions, strength-
en a company’s ability to identify disruptive moves that lead to growth.

A Leading Tier 1 Automotive Supplier Runs an Internal Incubator to Speed up New Ideas

A leading tier 1 automotive supplier set up an Incubator Program Office (IPO) in 2014 to foster and launch projects and business ideas that are linked to mobility and its wider core business.

The IPO has been created as a designated, start-up-style internal unit, spanning all continents. It hunts for new business ideas within its own parent but also outside it. Internally, it consults staff of all ranks and functions for potential future ideas, while externally it collaborates with innovators situated in its wider ecosystem outside its own organization.

If a suggestion qualifies, the IPO pushes its further development as far as possible to test market levels. Within five years, the incubator aims at extracting a viable portfolio of new companies or projects.
from its regional hubs in Europe, China and the US. And acting in the mode of a start-up, the IPO also aborts around 30 percent of its projects when they are identified as lacking promise.

Among the priority domains to explore are new tire material composites for high deflection structures, business applications that leverage the company’s expertise in tire design, or novel products and services that will enhance the mobility of goods and persons by leveraging IT.

Analysis of the market landscape and understanding the associated dynamics, innovation patterns were critical when setting up and operating the IPO. Various possible futures were also envisioned through a “divergence” exercise to identify, qualify and prioritize innovation spots.

Asking its employees for suggestions, the company received 4,200 contributions from Europe alone. The company also connected to the ecosystem of start-ups and acquired an ownership stake in young firms that were capable of providing solutions for certain ideas.

The IPO’s practices and those of other corporate examples can be distilled into three general recommendations for becoming a Reinventor.

1. **Align your business strategy and your incubator strategy.** The degree of freedom is significantly wider for an incubator than traditional R&D or innovation functions, but it is essential to define innovation priorities. Incubation needs to be focused to avoid being pulled in too many directions. Is the aim a new product, connected solution, or a mobility or digital service? Companies need to choose a few and then pair the incubator to these strategically important projects.
2. **Position your incubator at the proper level within the organization.** The service needs to directly report to a company’s innovation board structure. This type of visibility along with the right weight will ensure efforts can make headway. Guaranteeing the right level of engagement infuses confidence in the incubator as an agent for innovation. It can even unite the company, energizing all functions about the idea of generating new opportunities.

3. **Develop the ecosystem with the right partners.** With the necessary internal processes and approaches in place, companies will have a base from which to effectively collaborate with universities, other start-ups and third parties that complement them and supplement capability gaps. Automotive companies, for instance, need to acquire competence in telecoms, software and analytics to tackle the future challenge of the connected car. It’s something Renault did when it teamed up with Paris Incubateurs. By opening itself to collaboration, Renault has gained access to a host of start-up that will help them design innovative services, applications and technologies.¹⁸

---

**Schneider Electric Shows How to Best Leverage Start-up Partnerships¹⁹**

To achieve innovation, Schneider Electric, the leading global industrial equipment manufacturer, has in its core business always closely worked with technology partners to complement their solutions and architecture both in terms of hardware and software. However, the company realized that with the emergence of the digital era and more and more of their products getting connected, it had to open up to new and very different partner businesses. These partners are different in culture, agility or maturity and many of them are start-up businesses with only limited visibility on their long-term success or market uptake. The management at Schneider Electric realized that it was up to them rather than their partners to adapt.
So how did they go about it? They set up dedicated teams across the world in charge of developing relationships with these start-ups. What is key when working with young founding firms are the “use cases”. They need to be very focused and specific regarding what client issues they want to solve. Less is more when outlining your ideas.

In the old days this could not happen. Schneider Electric would set up broad based partnership at company levels, than create company-wide awareness. It was then left to the individual business units to decide whether or not to leverage the partnership. The drawback: this set-up took time. Energetic partnerships would swiftly wilt within the system leading to limited business outcomes.

Now in the new approach both partners, Schneider Electric and the start-up, focus on one or two use cases allowing for quick testing of start-up technologies in very pragmatic and quick sprints of three to six months maximum.

It is very much about change management and demonstrating the value brought to the organization but more importantly to the customer. Especially in the engineering community the mantra still too often goes: “We have the best technology, the knowledge and know what is best for the company.” One of the key change levers is to have the right leaders who share a vision of the New, and of “how to make it happen” and usually they come from the outside.

The market is at a very early stage for Schneider Electric’s new software-enabled products and the opportunity (and challenge) reside in the “making the market”. Anticipating the (potential) demand, allows Schneider Electric to better understand client readiness to adopt their new connected products, as well as fine-tuning the use cases – their relevance, potential business cases, pre-requisites. It is very much about understanding the why-behind-the buy of your customer, or the customer of your customer, through digital technology.
Gaining such an insight requires new approaches and methods such as ethnographic research, Design Thinking (see Chapter 4), working with channel partners, exploiting social media and understanding how the products and services will be used. This allows the company to fine-tune and align their solutions to the exact clients’ expectations and focus on the minimal viable solution, which will deliver the value expected by customers. This is a very efficient way to go about innovation.

So, why are so many companies failing when it comes to rebuilding their innovation processes? Although businesses have varying awareness levels of what they can do to develop incubator capabilities, many traditional operations are failing in this new world.

Take hospitality as a striking example of how companies can be caught unaware: seismic shifts from start-ups like Airbnb rattled the foundation of the industry’s operating model. Incumbents were also slow to catch on to online travel aggregators and distributors. One root cause: they underestimated the magnitude of change in the market place and the massive change that must take hold through their entire organization to compete.

Incubator services are not just about launching a new activity, a new process, or a new department within the company. They entail bringing new discipline, a new DNA, and a new mindset and infusing them throughout the company.

**Takeaways**

1. Experience beats product. Improved customer experience is where companies in the industrial sector have seen the greatest success from innovation in recent years.
2. New approaches to innovation can drive significant financial returns especially in sectors such as industrial equipment, consumer goods and consumer electronics.

3. Most industrial companies have very similar innovation investment profiles. The difference comes from the “how” rather than the “what.”

4. Open up to the outside. A new view of competitors and the ability to work in more open and fluid ecosystems are key.

5. Brilliant Innovators are solution-centered, powered by insights, drive pivotal leadership and operate at multiple speeds.
Chapter Takeaways at a Glance

Takeaways Chapter 1 – Industry’s Ongoing and Accelerating Digital Transformation

1. The industrial sphere is undergoing a profound, even dramatic change. Its drivers are many, among them the pervasiveness of connected technology, platforms and data optimization, hyper-personalization, and as-a-service business models. And we are just at the beginning of the change.

2. Tightly connected industrial manufacturing processes are going to go mainstream soon. The Industrial Internet of Things (IIoT), will digitally orchestrate factory floors, physical products, workers and more, unleashing enormous value.

3. Critical to success in this new digital industrial world will be the deployment of the right technology, preparation of the digital workforce, intelligent orchestration of both, and embedding of enterprises in the right ecosystems of business partners.
Chapter Takeaways at a Glance

Takeaways Chapter 2 – How the IIoT Leads to the Outcome Economy

1. The Industrial Internet of Things (IIoT) will drastically change the way companies work internally, work with each other, and sell to customers.

2. This will lead to “the end of the product” and the rise of a new kind of economy, the Outcome Economy (or “usage economy”). In this new world, tried-and-tested industrial hardware products are not only eclipsed by their much more profitable service qualities, the user experience and the ecosystems they operate in: They are also commercialized on a per outcome basis. It is the combination of living products and as-a-service business model that make the outcome economy.

3. This will be the era in which industrial companies move away from rigid business silos to more agile ecosystems and alliances with surprising partners. If they don’t, they won’t survive in the long run.

Takeaways Chapter 3 – Digital Super Value – A Guiding Light for Digital Strategy

1. Business as usual is over. Manufacturing companies can reap huge immediate and future financial rewards from digitizing their whole value chain. Society as a whole will also massively benefit via enterprises’ external value spread.

2. Understanding value is critical for an industrial business in devising a digitization strategy. Different values accrue from digitizing at different speeds. Different functions in different industrial sectors contain digital value pools of widely varying depth.
3. Although new digital business models have yet to deliver on their promise, only those companies investing ahead of existing and emerging competitors will capture the potential and establish leadership.

**Takeaways Chapter 4 – Six “No-Regret” Capabilities – the Journey Towards Digital, Mapped out Simply**

1. Digitally transforming your company is a challenging task that may look like a scary upheaval of all functions.

2. No perfect or predefined roadmap exists, but that doesn’t mean to do nothing. Figuring out the perfect and detailed roadmap for your company is near to impossible and of little value. Set the high-level directions for your company and dive in.

3. Start-up style rapid experimentation is the way to go. The rule of “deploy if successful, move on to the next idea if not” is standard in these firms. There should ideally be multiple rapid-experimentation sites across your enterprise to get the digital ball rolling.

4. There are six core “no-regret” capabilities to be targeted for the first steps towards a full-blown IIoT-powered enterprise: synchronizing the lifecycle clocks, embedding software intelligence and connectivity, using data analytics, rendering manufacturing facilities agile, understanding business as a service, creating and running smart ecosystems.

5. Try out each of these six “no-regret” capabilities and then combine. The benefits will only increase as you do so. This will contribute to quick wins and long-term success.
Takeaways Chapter 5 – Zoom in: How to Make Data Analytics Work Your Way

1. Data and the operational and commercial insights extracted from it are going to be the lifeblood of the industrial sector in the 21st century.

2. All companies have a wealth of unleveraged legacy data. Enriching this data will drive significant value in five main areas: (a) customer experience, (b) product performance, (c) workforce efficiency, (d) operational efficiency, and (e) portfolio optimization of new products and services.

3. Start progressively exploiting operational data hidden in your existing IT systems. Once the first pilots have delivered value, integrate external data. As your products become smarter and more connected, make the direct link.

4. Launch small, safe analytics pilots focused on specific use cases. Do so in as many areas of your company as possible and scale your data platform as soon as success clicks in.

5. Set up a cross-enterprise analytics capability to support all these initiatives within your company. Leverage data analytics service providers to accelerate the process and run pilots targeting both top-line and bottom-line opportunities.

Takeaways Chapter 6 – Zoom in: How to Handle Digital Product Development

1. The entire process chain around developing and designing industrially manufactured items is redefined by the emergence of the smart and connected product.
2. Strengthen your software capabilities – There will be more and more software embedded in your products. Software-enabled services and user experience will be critical, you need to build at pace your software capabilities.

3. A robust Digital Product Lifecycle Management (DPLM) must be the starting point for product development in the emerging era of data-driven Living Products. Set up the right DPLM capabilities: agility, scalability, software intelligence, and unified data connectedness.

4. Synchronize, but do not lock together, the two clocks – and ensure that marketing optimizes the resulting propositions and improvements with regard to the customer.

5. End-to-end. Let your DPLM run through your whole business and become its DNA.

**Takeaways Chapter 7 – Zoom in: How to Create a Connected Industrial Workforce**

1. The industrial worker of the future will be a data-based decision-maker and supervisory presence on the factory floor, in the engineering centers or on the field servicing products.

2. All business roles and functions will be affected as cobots and artificial intelligence will permeate the enterprise resulting in a blended workforce from the shop floor to the boardroom.

3. Don’t wait – proactively manage this revolutionary change in your company.

4. Craft new training and recruitment strategies now – start-up skilling your workforce and recruiting the talent now as the right
Chapter Takeaways at a Glance

skills will be in short supply. Explore new digital workforce models such as crowdsourcing.

5. Focus on your line managers, they will be critical in seeding and steering the change of your entire workforce while undergoing significant changes themselves.

Takeaways Chapter 8 – Zoom in: How to Master Innovation in the New

1. Experience beats product. Improved customer experience is where companies in the industrial sector have seen the greatest success from innovation in recent years.

2. New approaches to innovation can drive significant financial returns especially in sectors such as industrial equipment, consumer goods and consumer electronics.

3. Most industrial companies have very similar innovation investment profiles. The difference comes from the “how” rather than the “what.”

4. Open up to the outside. A new view of competitors and the ability to work in more open and fluid ecosystems are key.

5. Brilliant Innovators are solution-centered, powered by insights, drive pivotal leadership and operate at multiple speeds.

Takeaways Chapter 9 – Zoom in: How to Make the Most of Platforms and Ecosystems

1. Data-driven smart services will shape the New of the industrial world. They will allow for new hyperpersonalized and context-specific user experiences created through the connection
of smart products with platform-based services using the power of broad ecosystems.

2. Ecosystems and platforms are becoming innovation and growth engines for most manufacturing enterprises. This change will be fast, disruptive and redefine the rules of competitiveness.

3. Hold on to your data. In a data-driven economy, it becomes a product in itself – one with immense value.

4. Ecosystem yourself. Competition between products and companies will be replaced by competition between fluid digital platform-driven ecosystems. Start connecting your enterprise and products to the outside.

5. Anticipate and lead from the front in the move towards an ecosystem. Setting up partner ecosystems and embedding your organization in them takes time, cuts through the organization and implies a profound change in mindset. It will not happen by itself.
Eric Schaeffer is a Senior Managing Director at Accenture. He is leading Accenture’s Digital Industry X.0 program with the objective of supporting industrial companies in harnessing digital opportunities – new services and business models – and transformation waves spanning across the whole enterprise.

Schaeffer also leads one of Accenture’s global business services – Accenture Product Lifecycle Services – which provides end-to-end services to unlock value and efficiencies from product data across the engineering value chain, from the innovation and product development through to the manufacturing, aftersales and warranty services.

Schaeffer’s primary industry focus is automotive and industrial equipment manufacturers, his secondary industry focus is freight and logistics and transportation and travel. His project track record covers business transformation programs encompassing complex business and technology changes and he has lead such programs for large and multinational companies.

Prior to his current global Industrial role at Accenture, Schaeffer was responsible for Accenture’s Products (Industrial, Consumer Goods, Pharma and Retail) practice in France, Germany and Switzerland.

Schaeffer joined Accenture in 1987. His background is in Engineering and he studied at École Supérieure d’Electricité.

He is based in Paris, France.
»With this inspiring book, Eric Schaeffer demonstrates the monumental impact that the Industrial Internet of Things has on the industrial sectors, and clearly shows how this can be harnessed for major competitive advantage, profit and growth.«

Cyril Perducat, Executive Vice President,
Digital Services Transformation, Schneider Electric

»This groundbreaking book helps leaders and managers to thrive in the face of endless digital transformation. INDUSTRY X.0 is an inspirational call-to-action for everyone associated with the industrial sphere.«

Stefano Porcellini, Managing Director, Biesse Group

»The steady drumbeat of digital disruption has come to manufacturing in a way unequalled for decades. But where do you start? It’s one thing to know you will be disrupted, and another to join the disruption and outpace your attempted replacement. That’s where INDUSTRY X.0: REALIZING DIGITAL VALUE IN INDUSTRIAL SECTORS comes in – more than a warning shot, it’s a prescription – and a medicine every industrial leader should take. A must-read.«

Richard Mark Soley, PhD., Chairman and CEO, Object Management Group;
Executive Director, Industrial Internet Consortium

»INDUSTRY X.0 comes at an opportune time, as science and technology unleash disruptive change across all fronts. It reveals how seismic shifts in industrial sectors will significantly improve customer outcomes. It is a practical how-to advice for companies to stay relevant in the new age of the Industrial Internet of Things. A thought-provoking book – meticulously researched and clearly explained.«

Mehran Gul, Project Lead, Digital Transformation Initiative,
World Economic Forum