REINVENTING BUSINESS WITH DIGITAL
A CDO Handbook
FOREWORD

We live in a time of accelerating connectivity and rapidly expanding machine intelligence—in a world where we can fully exploit digital technologies across industry value chains. Leading in this new environment—using digital to transform core businesses while growing new ones—should be the top priority on the business agenda.

Imagine finding exponential improvements in efficiency and delivering new hyper-personalized customer experiences that drive growth at the same time. That’s the promise of digital reinvention: an open, dynamic, and inclusive approach to embracing technological change and profiting from it.

But it’s not really happening: Despite US$1 trillion spent globally on digital transformation last year—roughly half of India’s total GDP—the needle hasn’t moved very much. The reason: most companies are still investing in digital mainly to improve efficiency. Only a few are getting the maximum benefits by creating digitally enabled business models that drive top-line growth as they use digital to streamline operations.

The Chief Digital Officer—the subject of this paper—can help companies optimize both top-line growth and bottom-line efficiency through digital. Strategically positioned at the intersection of business and technology, the CDO understands business priorities and has deep knowledge of the digital tools that can help achieve them. Today, we are only seeing a glimpse of how industries will be reinvented by digital. Part of the CDO’s mission must be to explain how digital can change the company’s future and teach the value of digital to the entire organization.

Our clients urgently need to become digital disruptors—and not the disrupted. That means digitally transforming their core business while reinventing their industries around new digital business models. Only by doing both at once will companies have a chance to see quick returns on their investments in digital transformation.

By providing a roadmap to success for CDOs, this guide can help companies kickstart the journey to digital reinvention.

Anindya Basu
Country Managing Director, Accenture India
Digital technologies are becoming increasingly pervasive. From auto factories to drilling rigs and even banks, digital systems are enabling companies to work faster and smarter— and to build new business models to drive up sales.

Unprecedented advancement in computing abilities is being powered through advances in machine learning, while the costs of robots, IoT sensors, 3D printing equipment, and other digital tools continue to plunge. This real threat of digital disruption makes digital reinvention necessary—now.

But many simply aren’t getting the most out of their digital investments. What’s the evidence? We talked to executives at more than 900 large companies around the world, in the 21 biggest industrial countries. Only 13% said they were getting greater efficiency, cost savings and business growth from their digital investments. That’s a low number, but the good news is that companies can seize the opportunity, now, to improve on both.

It turns out that too many businesses are still deploying digital technologies in silos, many even without a proper roadmap. As a result, they continue to play catch-up in the race to digital reinvention. The honest answer to this problem? A ‘reinvent-with-digital’ strategy to be executed by the Chief Digital Officer (CDO). Our research team has identified six core imperatives, companies must address to successfully move a ‘reinvent-with-digital’ strategy from plan to reality.

With the guidance of a CDO, companies can find ways to increase efficiency while also using digital to build better customer experiences that generate sustained topline growth.

We hope you’ll consider sharing this journey with us. This report is a good place to start.

Sarajit Jha
Chief Digital Value Acceleration, Tata Steel
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CHAPTER I
PACE OF TECHNOLOGICAL PROGRESS IS UNLOCKING UNIQUE OPPORTUNITIES

Globally, technology costs are plummeting at an unprecedented pace. The price of industrial robots, for example, has declined by a factor of 28 since 2007. The cost of sensors has fallen by a factor of 375 since 2009, and of 3-D printing 400 times since 2007 (Figure 1).

FIGURE – 1: PLUMMETING TECHNOLOGY COSTS

![Drones](image1)

<table>
<thead>
<tr>
<th>DRONES</th>
<th>3D PRINTING</th>
<th>INDUSTRIAL ROBOTS</th>
<th>SENSORS</th>
<th>SMARTPHONE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>143X</strong> REDUCTION</td>
<td><strong>400X</strong> REDUCTION</td>
<td><strong>28X</strong> REDUCTION</td>
<td><strong>375X</strong> REDUCTION</td>
<td><strong>50X</strong> REDUCTION</td>
</tr>
</tbody>
</table>


Lower prices have led to an explosion of data and connectedness. At the end of 2016, there were more than 6.4 billion connected devices¹, with mobile devices alone creating close to 120 exabytes of data². The volume of big data in India alone is expected grow eight-fold, reaching an estimated value of US$16 billion by 2025³. This giant leap in data and connectedness is transforming business models and enabling new customer experiences in India—and the rest of the world (Figure 2).
At the same time, breakthroughs in advanced technologies such as artificial intelligence, quantum computing, blockchain and machine learning are reaching a mature state in quick succession. This convergence of maturity curves enables companies to implement multiple technologies at once, generating combinatorial benefits. (Figure – 3). Amazon for instance, is using autonomous robots in its warehouses, drones for delivery, machine learning and AI for virtual assistants like Alexa, in addition to big data analytics and cloud for its e-tailing business.
Two key objectives are driving digital technology adoption globally

Companies no longer perceive digitization as an end state. Instead it is an ongoing process aimed at achieving two objectives:

• Greater operating efficiency; and
• Unlocking new sources of growth and revenues with new customer experiences

In 2017, Accenture surveyed 931 senior executives; 96 percent of whom said they were investing in digital to pursue these twin goals. (See About the Research)

As the head of e-commerce & big data of a consumer electronics retailer points out, “We are leveraging digital technologies such as virtual reality to enhance in-store customer experiences and drive sales. At the same time, we are using digital to optimize our operations and achieve higher operational efficiencies.”
HDFC Bank, for example, used a combination of Artificial Intelligence (AI) based technologies to create chatbots HDFC Bank EVA for their web and mobile sites, and HDFC Bank OnChat for Facebook Messenger. EVA is a virtual customer service assistant developed in partnership with Senseforth Technologies to aid online users get quick answers to their frequently asked questions. It has successfully handled over 1.5 million conversations and addressed over 3.5 Mn queries since its launch. HDFC Bank OnChat is India’s first AI enabled e-commerce chatbot developed in partnership with Niki.Ai. OnChat works on the Facebook Messenger platform and allows customers & non-customers alike to carry out 9 separate ecommerce transactions such as bill payments, mobile recharges, movie & event bookings, cab & bus bookings etc. by simply typing a message. Launched in January 2017, this “conversational banking” platform is growing at 160% per month, and had handled more than 2.4 million messages in all grossing over INR15 million in transaction value, within 9 months of being operational.

ABOUT THE RESEARCH

In 2017, Accenture conducted a survey of 931 senior executives from large companies (most with turnover exceeding US$1 billion) across 12 manufacturing and production industries. The survey covered companies in Australia, Brazil, Canada, China, Denmark, Finland, France, Germany, India, Ireland, Japan, Mexico, Norway, Republic of Korea (South Korea), Singapore, South Africa, Sweden, Switzerland, The Netherlands, the UK and USA. Out of the 931 companies, 29 were headquartered in India, representing industries such as Automotive, Communications & Hi-Tech, Consumer Goods, Oil & Gas, and Life Sciences.

THE SURVEY SOUGHT TO UNDERSTAND:

i. What digital technologies are being deployed to drive new efficiencies and hyper-personalized customer experiences;

ii. The challenges faced by businesses while deploying digital technologies; and

iii. How much is being invested in digital technologies and capabilities to deliver new efficiencies and hyper-personalized experiences
Companies in India and around the world understand that they are competing for customers in new ways. After two decades of ecommerce, more than 800 million individuals around the globe are ready to consume hyper-personalized experiences, such as seeing instant recommendations based on their online activity and history. A recent Accenture study finds that 84% of executives across sectors believe that delivering differentiated customer experiences will strengthen their competitive advantage.

Executives are equally eager to control costs, even as they invest in new customer experiences so that they can maintain a balance between top-and-bottom line growth. Using digital to realize operating efficiencies allows them to do that.

Yet, even with a strong intent to use digital for both growth and efficiency, only 13 percent of all the companies we surveyed are doing so. (Figure - 4)

**FIGURE – 4: ONLY A FEW COMPANIES ARE SUCCESSFULLY USING DIGITAL FOR EFFICIENCY AND GROWTH**
THE COST OF INACTION

Exposed to disruptive competition, companies understand the implications of failing at creating better customer experiences and finding ways to reduce costs, simultaneously. In our survey, 64 percent of executives said they fear for their company’s survival if they are unable to deliver on these two imperatives with their digital investments.

These executives know how quickly companies can stumble when they miss the digital wave. BlackBerry, for example, famously failed to anticipate that, consumers — not business users — would drive the smartphone revolution. It also failed to capitalize on the popular BlackBerry Messenger instant-messaging service, which it did not make available on non-Blackberry platforms. WhatsApp, which could be used on any smartphone, quickly took the instant messaging lead and built a business with a multi-billion-dollar valuation6. The Blackberry story illustrates how companies must reinvent themselves to avoid being disrupted in the digital era.

As the CDO of a leading steel company in India points out, “Frequent changes in the external environment pose many risks for business. The rapid emergence of digital technologies is one such external factor. But it is as much as an opportunity as it is a risk; and can enable companies to deal with the fast-moving future.”
CHAPTER II
COMBINE MULTIPLE TECHNOLOGIES TO GET THE BEST RESULTS FROM DIGITIZATION

Companies must seize every opportunity to leverage digital technologies to disrupt business-as-usual processes and build new business models that deliver great customer experiences and drive growth. This means using digital, across functions, business units, and geographies to create seamless, data-driven organizations. The world is quickly moving past the point of using digital as a tool to simply transform key parts of the enterprise.

This is where the combinatorial power of digital comes in. Our research shows that using combinations of technologies multiplies financial value beyond what each technology would deliver on its own. We measure that impact both in cost savings per employee and potential increase in market capitalization across different industries. For example, we estimate that companies in the industrial equipment sector could cut down the total cost per employee by almost 20 percent, if they combine autonomous robots, artificial intelligence, blockchain, big data analytics and 3D printing. We also estimated how similar technology combinations could boost market value for manufacturers across industries. Oil & Gas companies we surveyed globally, could grow their market value by almost 44 percent if they combined technologies such as virtual reality, big data and artificial intelligence. (Figure—5).
FIGURE 5: COMBINING TECHNOLOGIES LEADS TO HIGHER SAVINGS AND GREATER MARKET VALUE

INCREMENTAL SAVINGS IN COST PER EMPLOYEE

<table>
<thead>
<tr>
<th>Technology</th>
<th>Industry</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>3D Printing</td>
<td>Automotive</td>
<td>13.9%</td>
</tr>
<tr>
<td>Autonomous Robots</td>
<td>Industrial</td>
<td>19.6%</td>
</tr>
<tr>
<td>AI</td>
<td>Natural Resources</td>
<td>15.7%</td>
</tr>
<tr>
<td>Blockchain</td>
<td>Aerospace &amp; Defense</td>
<td>17.3%</td>
</tr>
<tr>
<td>Digital Twin</td>
<td>Chemicals</td>
<td>22.0%</td>
</tr>
<tr>
<td>Big Data</td>
<td>Medical Technology</td>
<td>45.5%</td>
</tr>
<tr>
<td>Machine Learning</td>
<td>Electronics &amp; High Tech</td>
<td>31.1%</td>
</tr>
<tr>
<td>Mobile Computing</td>
<td>Life Sciences</td>
<td>41.7%</td>
</tr>
</tbody>
</table>

ADDITIONAL GAINS IN MARKET CAP

<table>
<thead>
<tr>
<th>Technology</th>
<th>Industry</th>
<th>Gains</th>
</tr>
</thead>
<tbody>
<tr>
<td>3D Printing</td>
<td>Natural Resources</td>
<td>26.3%</td>
</tr>
<tr>
<td>Autonomous Robots</td>
<td>Aerospace &amp; Defense</td>
<td>16.8%</td>
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<tr>
<td>AI</td>
<td>Chemicals</td>
<td>25.6%</td>
</tr>
<tr>
<td>AR/VR</td>
<td>Medical Technology</td>
<td>14.7%</td>
</tr>
<tr>
<td>Autonomous Vehicles</td>
<td>Oil &amp; Gas</td>
<td>43.9%</td>
</tr>
<tr>
<td>Big Data</td>
<td>Industrial</td>
<td>24.9%</td>
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<tr>
<td>Blockchain</td>
<td>Life Sciences</td>
<td>12%</td>
</tr>
<tr>
<td>Digital Twin</td>
<td>Automotive</td>
<td>0%</td>
</tr>
<tr>
<td>Machine Learning</td>
<td>Consumer Goods &amp; Services</td>
<td>34.5%</td>
</tr>
<tr>
<td></td>
<td>Electronics &amp; High Tech</td>
<td>48.1%</td>
</tr>
<tr>
<td></td>
<td>Utilities</td>
<td>28.5%</td>
</tr>
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</table>
DIGITAL REINVENTION IS MORE THAN JUST MIX AND MATCH

Combining technologies for the sake of combining is not the point; this isn’t a simple game of mix-and-match. The choice of technologies is determined by proven business needs and opportunities. At the same time, companies must also take the broadest possible view of how they can apply digital technology to reinvent operating models, production processes, and value chains.

Digital reinvention is also about a new way of managing and crafting strategy: companies need to embrace constant technological change—and profit from it. They need to move beyond experimenting with IT bundles or SMAC (social, mobile, analytics, cloud) stacks. Instead, they need to start embedding digital into all processes and strategies, and combining technologies to drive both top and bottom-line growth through efficiencies and hyper-personalized customer experiences.
“While planning for digital transformation, we look beyond the now, to technologies that have the potential to drive disruptive competitive advantages for our business in the future. But as we scan the horizon for such technology choices, we ensure that we have one feet in the present and continue to leverage existing technology capabilities to the fullest,” says the CDO of a leading non-banking finance company in India.

Clearly this is an enormous challenge that will involve both technical and managerial skills, as well as strong leadership. Therefore, the Chief Digital Officer is a critical player in the company’s success in the digital era. The CDO defines the digital reinvention roadmap and helps lead the organization through the journey. The CDO will be a strategic business partner to the CEO and board, constantly advising and guiding the C-suite to keep pace with the rapid—and ongoing—changes in the digital landscape.
CHAPTER III
CDO – THE DRIVER OF DIGITAL REINVENTION

Digital reinvention can be a daunting assignment. It is a multi-year, complex project that will touch every part of the organization. The CDO’s job—plotting the path, managing execution, and creating the ability to continuously deliver new capabilities to the business—is complicated by the need to work with legacy systems. It is difficult even to know where to begin. Based on our experience with Indian companies that are succeeding in digital transformation, we recommend three steps for CDOs.

STEP I: SET A ‘REINVENT WITH DIGITAL’ STRATEGY

In India and across the world, companies are reinventing themselves for the digital world. Digital technologies and tools are expanding from a support role and becoming the very means of production.

Digital technologies are transforming business models, operations and processes, products and services, and even customer and ecosystem interactions. It is time that businesses rethink how they approach digital. We therefore suggest a ‘Reinvent with Digital’ strategy.

In words of the CDO of a leading Indian glass packaging company “One of the first things I did on taking up this role, was to develop a digital-first strategy and a digital roadmap for our business, rather than simply infusing digital in the strategy of the company with point solutions.”
STEP II: SET THE AGENDA IN THE C-SUITE

To plot the path for implementing a ‘reinvent with digital’ strategy, the CDO needs to understand what the priorities are in the C-suite. As a leader who understands both technology and business, the CDO must collaboratively work with the C-suite to identify threats and opportunities for the business. As a CDO “we have a complete end-to-end understanding of the business along with a keen interest in technology, which helps us shape the digital reinvention process,” said the CDO of a large multinational consumer appliance manufacturer. He also added that, ‘forcing a digital strategy down to functional leads never works’.

CDOs must work with their top leadership to articulate the role digital must play across the business by asking the right questions. (Figure – 6).
FIGURE – 6: QUESTIONS FOR THE C-SUITE IN THE CONTEXT OF A ‘REINVENT WITH DIGITAL’ STRATEGY

**CEO**
- How does digital grow our business and improve our enterprise value?
- Where do potential risks to being digitally disrupted originate (from companies within or from those outside the industry)?
- Can we leverage digital to design new business models, and achieve a first-mover advantage in our industry or use it to expand to adjacent sectors?

**COO**
- How can the company use digital technologies for increased speed to market and operational flexibility?
- How can digital technologies radically improve process efficiency and human productivity?

**CFO**
- How will a ‘Reinvent with Digital’ strategy impact margins and profitability?
- How will the pace of digital technology adoption impact cash flows?
- How will digital technologies enable better financial decision making?

**CMO**
- How will a ‘Reinvent with Digital’ strategy align to the needs of the digital customer?
- How will digital technologies be utilized to deliver hyper-personalized customer experiences seamlessly across different customer touchpoints?
- How will digital be used to attract new customers and retain them longer?
• How can the talent architecture be transformed to execute a ‘Reinvent with Digital’ strategy?
• How can digital tools be used to scale skills development programs across the enterprise?
• How can talent from the ecosystem be leveraged to execute the ‘Reinvent with Digital’ strategy?

CHRO

• How can the existing IT infrastructure be leveraged to achieve cost-effective digital technology adoption?
• How must existing digital assets and knowhow be seamlessly integrated with new IT to ‘Reinvent with Digital’?

CIO
STEP III: MANAGE IMPLEMENTATION

Defining a ‘Reinvent with Digital’ strategy is one thing, implementing it to achieve digital reinvention is quite another. A wholehearted commitment to digital does not necessitate massive capital outlay. It is prudent for companies to take baby steps to digital reinvention, rapidly piloting ideas before they bet significant resources on building out digital assets. Take for instance Tata Steel, which is moving a steady stream of ideas from ideation to evaluation and finally through to implementation. In mid-2017, it’s Tubes business piloted 3 ideas: video analytics for safety, predictive asset management and a digital sales platform for its distributors. These pilots have not only helped identify deployment parameters that required improvement, but have also revealed multiple possible use cases. Tata Steel expects these three initiatives to deliver costs savings of over US$1.5 million a year once deployed. But that’s not all. The larger benefit that Tata Steel foresees is an organic, enterprise-wide cultural change, that enhances the acceptance and enthusiasm among employees to drive change with digital.

Through our in-depth research we have identified six core imperatives that CDOs must address to successfully move a ‘Reinvent with Digital’ strategy from plan to reality. By meeting these imperatives, CDOs can profitably combine digital technologies to drive new efficiency gains, and create enhanced customer experiences in parallel.

Based on the experiences of leading companies, we also identify challenges and possible outcomes that CDOs can expect in their journey of digital reinvention.
DIGITIZE THE CORE

Companies need to digitize their core business, engineering, and production systems, to drive new levels of efficiency.

Bajaj Electricals has set up a dedicated IoT center to act as the fulcrum of its digital transformation. The center aims to make extensive use of real-time analytics to help its B2B and B2C businesses make data-driven decisions using dashboards and advanced modeling. Bajaj Electricals is also working to ensure consistent deployment of digital technologies across its value chain. The company has replaced its manual bill discounting process with a blockchain system developed by Yes Bank. All transactions are now paperless and the cycle for bill discounting has been reduced from five days to almost real-time\(^7\).
### SUGGESTED ROADMAP

<table>
<thead>
<tr>
<th>ACTION ITEMS</th>
<th>CHALLENGES TO IMPLEMENTATION</th>
<th>ROLE OF THE CDO</th>
<th>EXPECTED OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INTEGRATING FOR A CONNECTED VALUE CHAIN:</strong></td>
<td>Friction between emerging digital technologies and legacy IT systems</td>
<td>• Develop an overall roadmap to spearhead digitization of the analog/fragmented value chain</td>
<td>Reduction in technology spillage and technology debt</td>
</tr>
<tr>
<td>Integrating hardware and software to digitally connect processes, platforms, and people across the value chain.</td>
<td>• Help setup an apex digital committee that drives guided coalition for change</td>
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</tr>
<tr>
<td></td>
<td>• Create an inter-linked, open and technology-agnostic data network to connect every component of the value chain.</td>
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<td></td>
</tr>
<tr>
<td><strong>STRATEGIC DIGITAL ALIGNMENT:</strong></td>
<td>Poor alignment across the C-suite on key issues (e.g. perception around how soon a business will be digitally disrupted)</td>
<td>• Build a succinct, convincing narrative to discuss digital transformation</td>
<td>Creation of direct and meaningful linkages between the business and the digital strategy</td>
</tr>
<tr>
<td>Ensuring consistent understanding and deployment of digital strategy across the company and ecosystem.</td>
<td>• Work closely with the CEO, the CIO, business-unit heads, and the CFO to map digital capabilities to strategic priorities</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Seed digital champions in every business unit/function</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AUTOMATION AT SCALE:</strong></td>
<td>High up-front costs and short execution times lead to unreasonable expectations</td>
<td>• Work with business unit heads to identify pain points where automation can be most beneficial</td>
<td>Cost optimization and reduction in human errors across key enterprise and business processes and operations</td>
</tr>
<tr>
<td>Automating at scale to optimize processes for the business.</td>
<td>• Deploy suitable digital technologies to automate identified tasks and processes through pilots, with an aim to scale successful pilots across the organization</td>
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</tr>
</tbody>
</table>
Companies need to create new business models to drive differentiated value for their clients and new revenue streams for themselves.

Mahindra Tractors, a subsidiary of the Mahindra Group launched Trinngo, a farm equipment sharing platform that offers tractors and other equipment on a pay-per-use basis—an Uber for tractors. The service lets farmers reserve tractors from a fleet that includes both company-owned tractors and those owned by other farmers. Launched in June 2016, the service is off to a successful start, serving 50,000 farmers and clocking more than 40,000 total hours of use. In the coming year, the company plans to extend its services to over 1 million farmers.

Other Mahindra group companies are building new digital businesses. SmartShift, for example, is an intra-city logistics transportation platform for small businesses and shopkeepers. Carworkz aggregates information about garages and service stations that provide maintenance and repair services. Motorists can use the Carworkz app to research a service provider and book an appointment.
### Incubating As-a-Service Business Model

**Develop as-a-service business models using software-based services and pay-per-use revenue models.**

- Building unique, differentiated as-a-service business models that competitors find costly to duplicate.

### Challenges to Implementation

- Identifying outcomes (e.g., customized or personalized experiences), businesses are keen to build in their digital customer value proposition.
- Leveraging the new IT and digital architecture stack to underpin as-a-service business models; ensuring agile and scalable delivery of offerings.

### Role of the CDO

- New sources of revenue by leveraging digital offerings.

### Reinvention of the Product

- Building connected, intelligent products from scratch, and embedding intelligence into existing products, to allow for adaptive ecosystem interactions.

- Extensive research and development time
- High costs of development

- Spearhead creation of intelligent offerings having an immediate impact on the topline.
- Rigorously examine the optimal combination of digital technologies best suited to develop intelligent products from scratch, as well as those useful for embedding intelligence in the existing product line of the company.

### Expected Outcome

- Hyper-personalized experiences delivered through products that become “containers for software and new IT.”

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**Suggested Roadmap**

<table>
<thead>
<tr>
<th>Action Items</th>
<th>Challenges to Implementation</th>
<th>Role of the CDO</th>
<th>Expected Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Incubating As-a-Service Business Model:</strong></td>
<td></td>
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**Reinvention of the Product:**

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Companies need to use their investment capacity to drive new, hyper-personalized experiences for customers, via multiple digital technologies. This will help grow core businesses by enhancing customer engagement.

Huawei, the Chinese multinational networking and telecommunications giant developed an automated network traffic control system called Network Mind, which enables self-adjusting control of voice and data services in ultra-large networks. Using technologies such as deep reinforcement learning and real-time big data mining and analytics, Network Mind automatically adapts and renews its traffic control models to match changes in network conditions. Network Mind is up to 500% more efficient than existing control methods in critical performance areas such as task completion and policy generation. Moreover, Network Mind is more than 50 times more efficient at analyzing large optical network paths and can analyze typical issues such as optical network failure prevention in just 6 minutes—a huge improvement over the 5 hours typically required.¹⁰
<table>
<thead>
<tr>
<th>ACTION ITEMS</th>
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<th>ROLE OF THE CDO</th>
<th>EXPECTED OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIG DATA ANALYTICS:</td>
<td>• Shortening data shelf life makes it challenging to identify the right data</td>
<td>• Establish an analytics team</td>
<td>Actionable insights to improve both bottom line efficiencies and deliver more tailored customer experiences</td>
</tr>
<tr>
<td>Using big data as the foundation for real-time insight generation and decision support.</td>
<td>• Generating useful cross-functional insights from collected data</td>
<td>• Collaborate with different process and business teams to extract insights from the data to achieve differentiated outcomes</td>
<td></td>
</tr>
<tr>
<td>HYPER-PERSONALIZATION:</td>
<td>• Disjointed data-analysis mechanisms leading to multiple interpretations around the nature of personalized experiences demanded by customers</td>
<td>• Help product teams identify experiences customers desire with the help of digital technologies</td>
<td>Enhanced customer engagement and new sources of revenue</td>
</tr>
<tr>
<td>Designing and deploying products, services, and platforms that adapt to changing customer needs</td>
<td>• Inadequate connect between product development and insights teams</td>
<td>• Develop and help business teams deliver hyper-personalized experiences which customers desire</td>
<td></td>
</tr>
<tr>
<td>SMART TOUCHPOINTS:</td>
<td>• Identifying and deploying the right digital touchpoints</td>
<td>• Work with product development teams to create intuitive smart touchpoints across the product lifecycle</td>
<td>Greater customer recall</td>
</tr>
<tr>
<td>Enhancing customer experience by creating smart touchpoints throughout the product lifecycle.</td>
<td>• Creating seamless physical and digital experiences through smart touchpoints</td>
<td>• Manage multiple touchpoints to avoid cannibalization</td>
<td></td>
</tr>
</tbody>
</table>
BUILD A DIGITAL-READY WORKFORCE

Companies need to hire, train and retain talent with digital-ready skills and encourage active collaboration between people and machines.

Tata Steel, the iron and steel major has made substantial progress in refocusing its internal culture to build a digital-ready workforce for the future. As part of its plan to prepare the organization for digital transformation, the company has fostered one-to-one relationships between millennial workers (employees aged under 30) and the more experienced leadership team. These relationships enable a reverse mentoring program where younger employees spend part of their time bringing senior leaders up to speed about the latest digital trends and technologies. What’s more, the design of this program allows both leaders and the millennials the freedom to shape their relationships as they desire. While some leaders seek help from their mentors for quick tips on technology, some others are leveraging their mentors to organize ideation processes for their teams. This serves both to motivate millennial employees through exposure to senior leaders, as well as provides an avenue for experienced employees to keep pace with rapidly evolving digital trends.
### SUGGESTED ROADMAP

<table>
<thead>
<tr>
<th>ACTION ITEMS</th>
<th>CHALLENGES TO IMPLEMENTATION</th>
<th>ROLE OF THE CDO</th>
<th>EXPECTED OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>SKILL TRAINING FOR DIGITAL:</td>
<td>• Identifying a comprehensive portfolio of future ready digital skills</td>
<td>• Work with the CHRO and functional teams to identify the core digital skills required to drive more efficient and customer centric outcomes</td>
<td>A digitally empowered workforce</td>
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<tr>
<td>Equipping workforce with software engineering and other skills to help drive productivity improvements and innovation potential.</td>
<td>• Ensuring that skill training keeps pace with technology change</td>
<td>• Design customized training programs in collaboration with functional leads</td>
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<td>• Expose the organization to the best of digital exemplars through external networks</td>
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<td>DIGITAL ROLES:</td>
<td>Resistance within the organization to changing nature of roles.</td>
<td>• Catalog, coordinate and oversee introduction of digital activities into workforce roles</td>
<td>A pool of human capital open to driving value with digital technologies</td>
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<tr>
<td>Developing digital components to multiple roles being performed by the workforce.</td>
<td></td>
<td>• Act as a change manager by leveraging insights from workforce to design activities that augment their performance</td>
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<td>HUMAN-MACHINE COLLABORATION:</td>
<td>Designing machines that can “understand” human behavior and tailor interactions to different kinds of workers</td>
<td>• Leveraging digital technologies to complement and enhance human cognitive capabilities</td>
<td>A safer and a more creative workforce</td>
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<td>Redesigning roles to encourage routine collaboration between employees and autonomous robots/machines</td>
<td></td>
<td>• Focusing on automation of repetitive tasks to improve worker productivity</td>
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BUILD NEW ECOSYSTEMS

Companies need to create a robust ecosystem of suppliers, distributors, start-ups, and customers. These relationships can help scale new business models rapidly across the digital value chain.

German industrial equipment conglomerate Siemens built a powerful ecosystem to build support for its MindSphere IoT operating system. It has partnered with app developers, system integrators, technology suppliers, and infrastructure providers, including Accenture, Amazon, Microsoft, and SAP. Another planned initiative, the MindSphere Rocket Club, aims to connect leading IoT start-ups with Siemens’ international partners and customers to propel further adoption of MindSphere. Siemens is also developing MindConnect Lib, which will make it easier for developers to connect embedded devices to MindSphere. MindConnect Lib’s “northbound” application programming interface (API) is intended to enable rapid integration of Siemens MindApps and partner apps into Mindsphere, while its “southbound” API will simplify connection of third-party assets to MindSphere.
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<td><strong>ECOSYSTEM ORCHESTRATION:</strong> Combining efforts of different business partners (suppliers, peers, distribution) to create a digital value chain</td>
<td>• Managing varying levels of digital maturity among back-end and front-end partners</td>
<td>• Facilitate mutually value generating interactions across different ecosystem partners with the help of digital platforms</td>
<td>Seamless and ongoing flow of ideas across ecosystem partners that drive value for all</td>
</tr>
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<td><strong>TECH INCUBATION CENTERS &amp; COEs:</strong> Nurturing innovation clusters that design and prototype early-stage technology use cases.</td>
<td>Contextualizing and customizing global innovations and technology use cases to local, geo-specific needs</td>
<td>• Drive participation from the innovation ecosystem to build world-class incubation centers</td>
<td>An innovation pipeline that can be tapped to identify and scale existing as well as new business</td>
</tr>
<tr>
<td><strong>OPEN INNOVATION AND CO-CREATION:</strong> Obtaining and developing ideas for new products or services from a wide variety of sources, both internal and external</td>
<td>• Building desired openness within teams to accept new ideas and experiment with them in collaboration with innovators, external to the company</td>
<td>• Develop an open innovation agenda for the company in collaboration with the CEO and the COO.</td>
<td>A suite of quickly innovated customer relevant offerings</td>
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PIVOT WISELY

As companies pivot towards a ‘Reinvent with Digital’ strategy, they must strike a careful balance between investments in new businesses versus the core business. The goal is to synchronize innovation and growth. In this effort, traditional industrial companies can learn much from the best practices of pure technology companies.

Google’s parent company Alphabet invests in multiple early-stage businesses under what it calls “Other Bets.” The goal is to incubate successful businesses in the medium-to-long term. So, for instance, while the Nest smart thermostat remains a top seller in its category, Nest Labs has continued to launch successful new products like the Nest Cam Outdoor. Another Alphabet business is pursuing new solutions in diabetes management and robotic surgery. Revenues from Other Bets businesses jumped from US$327 million in 2014 to US$809 million in 2016, contributing to almost 1% of Alphabet’s total revenues. Not all bets succeed, but Alphabet continues to invest in the effort, because it recognizes that even with a healthy core business it needs to continue exploring sources of disruptive innovation.
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<td><strong>DIGITAL NATIVE C-SUITE:</strong> Building a leadership team passionate about and capable of using advanced digital tools in a variety of strategic and tactical initiatives.</td>
<td>Reluctance of C-suite executives to adopt digital, especially if the business is performing well and the current technology architecture is adequate.</td>
<td>• Encourage better understanding of how digital technologies can impact the quality of strategic decisions.</td>
<td>A digitally empowered workforce.</td>
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<td><strong>MAINSTREAMING DIGITAL CADENCE:</strong> Systematically and continuously investing in efforts to inject digital into mainstream operations.</td>
<td>Fragmented organization structure and siloed business operations.</td>
<td>• Orchestrate digital uptake via digital champions within each geography and business unit.</td>
<td>Businesses become adept at introducing the right technology into the market at the right time.</td>
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<td><strong>DIGITAL PERFORMANCE MANAGEMENT:</strong> Expanding shared performance metrics to capture progress on digital initiatives in addition to traditional performance outcomes.</td>
<td>• Justifying creation of new digital performance metrics.</td>
<td>• Establish indicators that measure how the combinatorial application of technologies drives value for the business.</td>
<td>Complete oversight of all digital initiatives and clear-cut performance evaluation metrics.</td>
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<td></td>
<td>• Defining and validating benchmarks for comparison of digital initiatives.</td>
<td>• Centralize monitoring of heterogeneous digital initiatives.</td>
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<td>• Devise new digital performance metrics to be used along with traditional KPI dashboards.</td>
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<td>• Setting digital performance KPIs for key leaders.</td>
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IN CLOSING

Indian businesses that master the art of combining digital technologies for top-line and bottom-line growth will be best positioned to compete and meet the challenges of digital disruption in their industries. The long-term winners will be the companies that understand that digital reinvention is a journey. It starts with a digital-first strategy that uses digital technologies in combination for maximum benefits. And it requires digital reinvention. Companies that embark on this journey today will emerge as the digital winners of tomorrow.
REFERENCES


