

Digital Transformation:

Your Path to Increased Revenue

By Jan Wall

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Digital Transformation: What's Trending in Business Today

Digital Transformation is one of the hottest trends in the private sector today. In fact, it will spell the difference between the winners and the losers. Companies that get it right are seeing their market caps soar; those that get it wrong are growing slowly or – even worse – falling by the wayside.

In the next few pages we will track the winners and losers in terms your chief financial officer can relate to. Then we will discuss the technologies and business initiatives that are driving business as well as the related organizational and leadership challenges. We will wrap up by

summarizing the threats companies will face even if they are successful in adopting the digital transformation.

What's Digital Transformation, Anyway?

When we talk about the Digital Transformation, we are talking about leveraging the Information Technology developments that are not only new, but have demonstrated (or hold the promise of demonstrating) significant business value. These are technologies that are coming of age in 2016 and 2017. In many cases, we have isolated success stories to inspire us but probably not a critical mass of implementations to ensure that there is a body of “best practices” to guide us. In other words, we are working at the frontier. Nevertheless, the directions are very, very clear.



Figure 1 <https://www.youtube.com/watch?v=Gsb1f5uoGWc>

When we talk about the Digital Transformation, we are talking about adopting the following types of technologies to drive significant business advantage.

- Internet of Things
- Machine Learning
- Big Data
- Collaboration Tools
- Digital Embedded Products
- 3D Printing
- Digital Marketing
- Mobile eCommerce
- Predictive Demand
- Predictive Maintenance
- Robotic Process Automation
- Customer Journey Analytics
- "As a Service"
- Remote Worker Enablement
- Digital Marketing
- Digital Service Management
- Smart Devices

In every case, adopting these technologies is easy. The difficult part is integrating the technologies into the fabric of the company and leveraging them to advantage. This requires companies to manage difficult organizational development processes which include shifts in organizational structures, shifts in compensation and recognition, hiring or training staff with new skills and ensuring that they have a "home" in the organization. While doing all this, management needs to learn how to provide the leadership that will be required and protect embryonic programs from cost justification models that are no longer relevant.

Success in Digital Transformation is a Prerequisite for Financial Success

One study¹ looked at the relationship between the financial success of companies included in Standard & Poor's 500 Index together with the 20 largest companies on the Toronto Stock Exchange and the number of references to terms that characterize the digital transformation used in the chairmen's annual letters. Due to selection criteria, the study dealt with only 449 companies. The results could not have been clearer. In every single industry (with two exceptions) interest in implementing digital transformation initiatives was highly correlated with the growth in those companies' market caps.

The industries included in the study were:

- Banking
- Biotech & Pharma
- Consumer Discretionary
- Consumer Packaged Goods
- Healthcare Equipment & distribution
- Healthcare Providers
- Information technology
- Insurance
- Materials
- Oil & Gas

¹ **Doing Digital Right**, Louis Lamoureux, 2017

- Retail
- Utilities
- Broadcasting and Communications
- Industrials
- Diversified Financial Services
- Internet Commerce and Services
- Real Estate and REITS

The study team studied the chairmen's letters in their annual reports to look for the frequency of 10 keywords. Those keywords were:

- Analytics
- App
- Big Data
- Cloud
- Digital
- Internet of Things
- Mobile
- Robotics, Robots
- Sensor
- Social Media

Interestingly, in total, there has been a steady, year-over-year increase over a five-year period in the number of times these keywords appeared in the chairmen's letters. That suggests that digital transformation issues are becoming increasingly important to senior management and the boards of directors. The strongest growth was in the use of the terms *big data*, *cloud*, and *analytics*.

The study team did not focus on the size of the companies or the counts of the 10 keywords, but rather the year-over-year

increases in the uses of these keywords and their year-over-year improvement in financial performance.

They found that there were strong positive correlations with the increase in the use of these keywords and three financial metrics:

- Market cap growth
- Net income market growth
- EBITDA margin growth

The correlations were less pronounced for two other financial metrics:

- Revenue growth
- Return of assets growth

Market capitalization is the most important of all these financial metrics. The 50% of these companies that used these keywords the most reported an average 18% average annual increase in market caps while the 50% that used these keywords the least reported an average annual increase in market caps of 12%. Let's look at this a different way. The first group of companies grew their market caps about \$4.25 billion a year while the second group grew about \$3 billion a year. That's a \$1 billion a year difference! Big money in my book.

GE reported that its digital services revenue was:
+ \$4 billion in 2006.
+ \$15 billion in 2016
+ \$225 billion (projected) in 2020

It would be foolhardy to claim that correlations like these dictate causality, but you have to admit that something interesting is going on here.

By the way, the two industries that do NOT follow this general correlation are banking and Biotech and Pharma. Market cap growth for banking did not keep up in proportion to its increases in the use of the keywords. Biotech and Pharma companies, on the other hand, increased their market caps far more than their use of the keywords would suggest. We won't speculate about why this is the case.

Technological Trends

Mobile Apps - Companies are developing apps that run on mobile devices or tablets. These are special purpose apps that can be designed to handle corporate-only needs, customer-only needs, or a blend of the two. The use of desktop and laptop computers is declining in relative terms.

Big Data - Companies are processing huge masses of unstructured data that comes from internal data bases and external sources. In fact, those external sources make up the bulk of the data processed. Companies use Big Data to identify new trends or insights that had not been considered before. This is quite different from traditional study approaches that started with an hypothesis that needed to be proven or disproven. Big Data provides insights

that improve machine operations, minimize downtime, and improve profitability among other things

Machine Learning -- Like Big Data, Machine Learning uses content-specific algorithms to process huge quantities of unstructured data. But, unlike Big Data, Machine Learning develops "skills" that outstrip the corresponding skills of human professionals. These "skills" include preparing recommendations on issuing lines of credit, diagnosing cancers, and assessing applications for prison parole.

Machine learning applications:

- + The American Cancer Society provides personalized advice via ML.
- + The Sloan Kettering Cancer Center accelerates DNA analyses using ML.
- + Under Armour developed an app that provides personalized fitness recommendations via ML.

There are 7.4 billion people in the world. 2.3 billion are active on social media. 3.8 billion are active mobile users.

Get the picture?

Cloud Computing – This refers to putting some IT functions on remote computers that are readily available over the Internet. These functions may include remote data storage, remote processing, or remote access to specialized software. We call it “cloud computing” because the users (companies or individuals) do not need to understand where the service is provided or the mechanisms of providing it. It is simply a utility that users can tap into on an “as needed” basis.

Internet of Things (IoT) -- This refers to putting sensors in a wide range of devices, setting up communication links between those sensors and a computer (or network of computers), using the knowledge to diagnose problems, track progress, or initiate corrective action. IoT provides the greatest value when it networks huge numbers of sensors and is coupled with algorithms that provide a significant “value-add.”

Mobile Computing – Consumers are switching away from desktop and laptop computers to their mobile devices instead: smart phones and tablets. This has huge implications for everything from website design to eCommerce to marketing.

Robots – For many years, robots were limited to factory floors carrying out routine tasks under tight controls. Robots today are capable of far more sophisticated tasks because they can “see,” “hear,” “feel,” and “taste.” They are often equipped with sensors that are required for their jobs and beyond the capabilities of people. For example, they can accurately measure temperature, barometric pressure, pressure, acceleration, location, time, and shock. Robots have become sophisticated enough that Spread, a Japanese agricultural company, uses robots to pick 30,000 heads of lettuce a day.

IOT examples:

- + window blinds that rise or lower depending on the ambient light
- + lamps that turn themselves off if you leave the house
- + door locks that recognize your face or fingerprint and unlock
- + lawn sprinklers that check the weather forecast and soil moisture before watering

The International Federation of Robots reported:

- + There were 248,000 industrial robots in operation in 2015.
- + Sales figures have increased 4x since 2009.
- + 2.3 million robots will be installed in factories by 2018
- + The automotive industry uses more than half of all robots.

Social Media – This technology originally appealed to high school and university students who just wanted to keep their friends up to date about their day-to-day activities. Today, companies are using social media to test the sentiment of their user and customer communities. They are also using it as an increasingly influential marketing channel.

Natural Language Processing (NLP) –

NLP is a branch of Artificial Intelligence that accepts human language in “raw” form, processes it, and assigns some “meaning” to the material it reads. In other words, NLP is a facility for computers to understand either written or spoken language. This is becoming increasingly important because only 20% of a company’s records are in structured formats. The rest is in emails, documents, videos, etc. NLP can process this unstructured material.

Computer Vision -- Computer Vision simulates human vision. It is the ability to understand images and videos. This enables robots to operate in messy environments and search for particular products or components.

This list is not exhaustive. In fact, new technologies are being introduced at such a rapid rate, that any list would be obsolete within a few months.

Apple’s Siri and Amazon’s Echo allow users to speak to them in natural language.

Industry Trends

“As a Service” - In the past, companies and consumers needed to buy or lease the computer hardware and software they needed. Now they can access only what they need when they need it over the net. *Software as a Service* (SaaS) allows users to access software applications that run in the cloud. Salesforce.com and many of the Google apps run on a *Software as a Service* basis. *Platform as a Service* (PaaS) provides users a software development environment as well as on-going operational support in the cloud. Users develop their own applications rather than using pre-packaged apps as they do with SaaS. *Infrastructure as a Service* (IaaS) is more basic. IaaS simply provides hardware, storage, and networks. IaaS users supply their own operating systems and load their own applications. This service allows users to scale up or scale down their use of raw computing power as their demands fluctuate.

Profits are in the Digital

Transformation Products - One article² reported that 86% of new products were introduced into existing markets while only 14% were into new markets. However, 61% of the profits came from the products in the new markets.

² “Identify Blue Oceans by Mapping Your Product Portfolio,” *Harvard Business Review*, W. Chan Kim and Renee Mauborgne

Digitizing the Supply Chain -

McKinsey projected improvements potential in this area: 30+% reduction in machine downtime, 20+% decrease in inventory holding costs, 20+% time to market reduction, and 10+% maintenance costs reduction.

Digitization in Human Resources --

Nearly all positions today require some expertise in IT. Staff expect to find at least the same quality IT experience at work that they enjoy with their consumer products. IT systems are the primary recruiting and screening tools for employees aged 18 to 34.

Online Research First, Sales People

Later - In the past, sales people made initial contact with prospects, provided the background material they needed to understand the issues involved in their customers’ buying decisions, and submitted proposals. Today, both corporate and consumer buyers do their own research online. They read white papers from thought leaders, review the “consumer reports” for their industry, and check out the social media comments about the companies they are considering doing business with. They call on salespeople only after they have thoroughly familiarized themselves with the issues and have a very good idea what they are looking for. Corporate success in the market, then, increasingly depends on companies’

abilities to present themselves to advantage in the online world: websites, SEO, social media, etc.

Customer Intimacy - Companies that provide IoT products and services often know their customers' operations more intimately than the customers themselves. This positions those manufacturers to make and justify recommendations to their customers that would be impossible otherwise.

Product Recalls - Companies that need to issue product recalls and can fix the problems with software updates that can be delivered over the net can handle their recalls with very modest costs. All others pay huge sums. For example, in 2014 GM paid \$4.1 billion for product recalls. This wiped out GM's profits in an otherwise banner year.



Application Trends

Rent, Don't Buy - Corporations and consumers will gravitate toward paying for services they need when they need them rather than buying products. For example, Daimler offers a service it calls *Car2Go*. Rather than buying a car, subscribers can pick up a car at a nearby location, drive it to their destination, and drop it off. They are charged for the use of the car only when they actually use it. Drivers manage the transaction through a mobile app.

Robots Will Replace People - Robots mix drinks for passengers on Royal Caribbean's Anthem of the Seas. Robots scurry around warehouses to retrieve goods on demand. They can assemble electronic components, sew garments, and make coffee.

Artificial Intelligence Apps

Outperform the Best Humans - AI apps offer cancer patients personalized information and advice. They speed up DNA analysis. They provide tailored health and fitness recommendations as well as provide financial advice to investors. They provide legal advice. They help KPMG staff improve their financial audits by blending financial data with free-form narrative.

Blurred Boundaries Between Physical and Digital Products

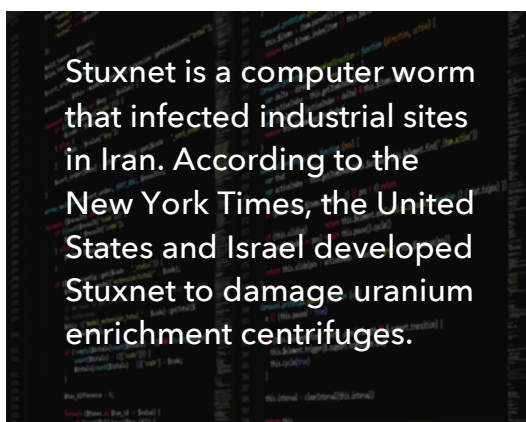
- Before the current wave of technologies, the boundaries between physical products and their digital add-ons were clear. Today companies sell products that can only work in a world that has made the digital transformation. The Apple Watch is only one small but obvious example. More importantly, customers - both corporate and consumer - demand products that have digital value-add components designed in rather than bolted on.

Organizational Trends

Digital Transformation Vision

Statements - In the past, companies incorporated new technologies on an *ad hoc* basis. Now senior management - and even the boards of directors - play active roles in defining their vision statements for digital transformation in their companies. Digital Transformation vision statements define what the companies plan to achieve in a few years.

Permanent Loss of Jobs -- Until recently, the jobs lost through the introduction of Information Technology were offset by new jobs that required higher level skills such as programmers, database managers, project managers, and systems designers. Now, it is clear that the jobs that are lost during this wave of digital transformation are unlikely to ever be replaced. Studies at Oxford University and MIT suggest that 47% of all jobs are likely to be permanently lost.³



permanent employees in favor of hiring staff on demand. Intuit projects that 40% of all work will be handled on contract by 2020.⁴

Finance Will Handle Higher Order Functions

- Historically, Finance has been responsible for paying the bills and the employees and providing periodic reports. Now it is also responsible for providing analytical insights into their companies' operations, managing business intelligence, and putting a dollar value on intangible assets.

Cyber Security Risks

Will Soar - Earlier this year Equifax suffered a security breach that stole information about 140 million Americans and 15 million people in the UK.⁵ This is a sign of more severe security risks in the future. Cyber-security

risks apply not only to companies' internal operations, but to the digital products and services they offer their customers. Companies now see cyber-

Contract or "Gig" Staff - There is a general move away from hiring

³ 47% of US jobs under threat from computerization according to Oxford study, <https://newatlas.com/half-of-us-jobs-computerized/29142/>

⁴ Intuit: On-Demand Workers Will More Than Double By 2020, <https://www.fiverr.com/news/on-demand-workers-double>

⁵ Giant Equifax data breach: 143 million people could be affected, <http://money.cnn.com/2017/09/07/technology/business/eqifax-data-breach/index.html>

security as a top priority. Many companies have created the position of Chief Information Security Officer (CISO). Banks use digital tools such as Machine Learning to track money laundering. Banks are automating compliance. Digital Transformation is vital to help banks manage the burden of growing legal requirements.

Government Will Play a Growing Role in the Digital Transformation -

Governments define what is possible. It was government that enabled the digital transformation in the first place by releasing the internet to the general public. It also created and released the technologies for GPS, radar, and microchips.

Manage Relations with External Stakeholders -

Companies must maintain a presence on social media. If not, bloggers and reporters will be the only source of online information about companies. Trans Canada Pipelines failed to understand this and found its application for a pipeline in the US turned down. The outcome could have been quite different with a more effective digital PR program.

Change Management - Changing the internal structure, staffing, information flows, procedures, and norms have been a constant in the corporate world. In the era of Digital Transformation, those changes are going to be far more rapid and more profound. Companies need to place far more emphasis on

change management and organizational development. Senior corporate leadership must be evangelists for new technologies and visibly support the changes through speeches, recognition programs, promotions, training programs, and compensation metrics.

“Digital Centric” Advertising - One authoritative study⁶ sponsored by Deloitte, the American Marketing Association, and Duke University reported that spending on traditional advertising has been dropping by 2.5% a year at the same time spending on digital advertising has been climbing 12+% a year. Internet oriented companies spend more on marketing: Companies that sell less than 10% on the internet spend less than 12% of their advertising budget online while those that sell more than 10% spend nearly 17% for online advertising.

Sales Process -- The best sales teams use sales analytics 3.5x more than the worst. The percentage of companies using analytics will grow from 47% this year to 74% next year. The best sales teams are 4x more likely to use mobile sales apps.

Huge Shortage of Executive Digital Knowledge - SAP conducted a study of business executives regarding digital transformation skills. Only 27% of the

⁶ CMO Survey Report: Highlights and Insights, Christine Mooman, August 21, 2016, https://cmosurvey.org/wp-content/uploads/sites/11/2016/02/The_CMO_Survey-Highlights_and_Insights-Feb-2016.pdf

respondents reported that their executives had the skills required to manage the digital transformation. Only 10% of the HR departments offered training (or access to training) to build the skills required for digital transformation.

Severe Shortage of Digital

Transformation Talent - There is a large and growing unmet need for staff at all levels who can implement Big Data, IoT, Machine Learning, and other Digital Transformation systems. Companies are addressing this talent challenge four ways: upgrading staff already on board, attracting talent from outside, buying companies with the talent intact, and partnering with other companies that have this talent.

Corporate Valuations Are Shifting to Intangibles - In 1985, 32% of the value of a company was tied to intangibles. In 2015 that reversed: 84% of the value of companies was tied to intangibles.⁷

Centers of Excellence - Senior management recognizes that most of the digital transformation initiatives it needs to take will not pass muster using traditional financial assessment standards such as ROI. Rather than force-fitting these financial analyses, companies are setting up Centers of Excellence (previously called skunk works) that are funded directly at the senior management level and bypass traditional financial assessment processes. These centers are designed to foster expertise, develop prototype applications, run pilot projects, and develop staff who can migrate into the mainstream when their apps do.

⁷ *Annual Study of Intangible Asset Market Value*, Ocean Tomo, N.p., March 5, 2015, <http://www.oceantomo.com/2015/03/04/2015-intangible-asset-market-value-study/>

End User Trends

Continual Upgrades Are the Norm -

Users expect the products they buy to be obsolete within a year or less. Apple recognizes this and offers a program that allows their customers to pay a monthly fee and enjoy upgrades to new iPhones on an annual basis.

Flawless Operations Are the Norm -

Users expect their equipment, software, networks, and data access to operate flawlessly. They no longer tolerate failures the way they did a decade ago.

Fast and Easy Access -

Corporate customers and end users now expect to find it fast and easy to work with companies. They expect the same ease of operation that they now find on Amazon, Airbnb, Uber, and Agoda.

Mobile Is the Norm - Corporate users and consumers increasingly interact via mobile devices rather than laptops.

Consumers Shape Opinion via Social Media -

Bloggers and end users report their opinions on Facebook, Twitter, and other social media channels. As a result, companies are focusing serious attention on their PR presence in social media.

Companies Now Spend Considerable Attention on "Mapping the Customer Journey" -

This includes helping users assess their need (high-level messaging), conducting research (third party research reports), making decisions (product specific information), adopting products and services (self-service content), using the product/service (advanced educational materials), and making recommendations (build close customer relationships).

Nike's recent annual report did not focus on shoes. It focused on community engagement.

Exelon operates nuclear power plants in the US. It developed a mobile plant management system. Results?

- + 50% reduction in staff overhead
 - + freed up 1.5 hours of worker time per day
 - + improved planner productivity 30%
 - + reduced rework
- Get the picture?

What's the Message?

Rapid adoption of the appropriate Digital Transformation technologies will determine the difference between the winners and the losers. However, the emphasis needs to be placed on identifying the business applications that have the highest payoff. Selecting the right technologies follows easily from that point on.