

On the digital disruption bus with a small and a big nation but no driver

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Chapter One: Unravelling disruption

'Disruption Specialists' have travelled a long way from the back of the school room.

They're now company strategists or start-up innovators.

One LinkedIn profile in the airline sector had 'Operations and Customer Disruption Specialist' as her headline title. Another was the 'Chief Disruption Officer' at a management consulting company. My mind boggled until I came across an ordinary 'Digital Disruption Specialist' in a mobile technology firm. He probably wants to 'free' us from the tyranny of fixed line communications to completely cellular ones. It's an understandable disruption, if no longer earth shattering.

Investors have a revolving door through which talented, stubborn, lucky, persuasive, young people march, eager to disrupt the world and make a fortune. Conferences are run, such as 'Techcrunch Disrupt' in 2015 at San Francisco, which was lauded as;

... one of the most anticipated iconic startup and thought leadership events of the year.¹

Eric Hippeau, one of the keynote venture capital speakers, claimed;

We only invest in innovation, so it has to be something disruptive—in business or technology.²

His ilk receive plenty of encouragement from the press. This typical article, entitled, 'Why everyone wants to be the next disrupter,' starts as follows;

For business, disruption is the 'new black'. How does it work?

As smart technology-driven upstarts turn business conventions on their head and attempt to grab market share from incumbents, the Holy Grail is to develop a digital platform that redefines traditional market structures and displaces conventional value streams.

Examples abound, from Airbnb shaking up the hospitality industry to app-based transport service Uber taking on the once untouchable taxi industry.³

Other nations follow the trend. In August 2016, a 'Digital Disruption New Zealand 2016' conference ran, crammed with speakers welcoming us on the bus. Their opening panel discussion is;

Disruption of Tomorrow – Anticipating and Planning for Future Disruption

Artificial intelligence, machine learning, nanotechnology; emerging technologies driven by rising processing power and poised to lead the next wave of disruption. It is important to not only look at disruptive technologies of today but those of tomorrow as well.⁴

¹ <https://www.crunchbase.com/event/techcrunch-disrupt-ny-2015-201554>

² <http://www.wobi.com/articles/5-questions-eric-hippeau>

³ <https://www.businessthink.unsw.edu.au/Pages/why-everyone-wants-to-be-the-next-disrupter.aspx>

⁴ <http://www.digitaldisruption.co.nz/conference-day-one-agendaday>

There is no doubt the globe is undergoing a serious digital disruption right now. It may not be the biggest disruption to hit our planet. That accolade still goes to the meteor that ended the dinosaur friendly earth—which was not a man-made event. Our current one is—and we appear to welcome it.

This book asks why.

If we don't welcome disruption, why do we not at least question it?

Why are we marching full steam ahead into an information experiment that will transform our lives when we don't know how it will turn out? There is no turning back. We cannot reach some viewing platform, pull the bus over to the kerb, and ask the passengers whether they want to continue after they have taken in the vista.

Daniel Sarewitz, a Director of the Consortium for Science, Policy & Outcomes at Arizona University, puts the issue another way in a letter written to anyone;

To whom it may concern:

I am writing to thank you for participating as a subject in the experiment. As a matter of full disclosure, I feel it only right to inform you that the experiment is likely to have very profound impacts on your life. These impacts may be quite positive—indeed, I presume that the anticipation of positive impacts explains why you are willing to take part. For example, many participants, perhaps including yourself, will become considerably more wealthy or healthy as an indirect consequence of the experiment. But I must also point out that the impacts may also be negative. Others may lose their jobs and otherwise find themselves increasingly at a disadvantage within our highly competitive society.

In the interest of openness I want to inform you that the experiment does not conform to the standard methods of rigorous scientific conduct. There is no control case. The experiment will go on, and we will see what happens. And the experiment cannot be replicated. We will be unable to determine what would have happened had we carried out a different experiment, or no experiment at all.

Nor are the subjects of the experiment—that is to say, you, among pretty much everyone else—protected by the ethical safeguards typically used by the scientific community for experiments involving human subjects. For example, prior informed consent is not required of the participants. I am writing to thank you for participating, but that is really more of a courtesy, a formality, than an acknowledgment that you have made a free choice to take part. In reality, you have little choice in the matter.⁵

Disruption in our age has several unique aspects to it, and one of those is our consciousness about the process. The mere fact Mr. Sarewitz wrote the article above indicates we are aware it's happening. We've even named it, borrowing the word from those unruly students. Prior disruptions in the information sector, such as the printing press in the sixteenth century, were not thought of in that manner. People were not conscious that the printer would disrupt society. Back then, they blamed the Pope, or the King of England, for the turmoil of that era. Even today, after all those centuries, many people would still not factor the industrial printer into the social turbulence that took place in those times.

To a certain degree this is also common today. It doesn't seem plausible to some that information technology will bring turmoil. However, that proportion is probably shrinking. Disruption is a ground level topic. I bet that you talk about disruption with your friends over a coffee. I guarantee you are

⁵ <https://www.wilsoncenter.org/sites/default/files/techassessment.pdf>

concerned about it if only in relation to the security of your job, or the employment prospects of your children. So at the personal layer of our society, the topic is alive and well.

Serious debates about our digital future are no longer raised at a significant level though. A changing political landscape lies behind this, and it's not entirely the fault of politicians either. You see, the global elements of digital disruption are changing politics as well. It is a rare ruler today who will disallow change or resist disruption, but there are a few. When we consider that one of those is the king of Bhutan, a tiny Himalayan nation that is increasingly envied around the world, and the creator of the GNH scale (Gross National Happiness), that might cause us to reflect.

Unfortunately it's easier to label such individuals as Luddites, after the movement that smashed mechanical weaving looms in the nineteenth century because they saw it would end their hand craft labour. New York author, Doug Rushkoff, who wrote 'Throwing Rocks at the Google Bus'⁶ in 2016, is accused of being a Luddite. In a world that calls for instant pigeon holing, at least we know there is a history of dissent weaving back into other disruptive eras. Those bystanders who threw the rocks at the Google bus in 2013 can easily be accused of doing the wrong thing, just as the Luddites were. They were trying to attract attention to a plight, and broke a law instead.

This is not a straightforward, cut and dried, topic. As Mr. Sarewitz frankly admits, past disruptions have suited certain global demographics well, including the members of that golden club, the OECD. This club comprises less than a fifth of the world's population, but the powerful players and the marketers of a golden future, virtually all come from the OECD. And they often tell us that our present life styles were attained through disruptive activities in the past. Don't worry, they reassure us, trust the process, it will work again to our advantage. Or, in the words of Bill Coleman, a venture capitalist;

We should take comfort in the course of the Industrial Revolution, which, despite a rocky transition from a more agrarian society, ultimately created a higher standard of living and a broad middle class.⁷

Not so, counters Kim Taipale.⁸ He claims that information was analog in the industrial age, in other words run on paper, and businesses needed lots of workers in the middle managing records. It was a vast inefficient system that created many well paying middle class jobs. It wasn't inefficient at the time though. That accusation is only relative, and sparked by the recent ability of information technology. Those jobs are being lost to information automation. As a result, that bulging middle class is morphing into a more normal Pareto shaped curve. The Pareto power curve is based on the 80/20 rule—20 percent of the people take 80 percent of the profit, 20 percent of the firms sell 80 percent of the product etc. Several internet studies indicate this curve is shaping information society too, only worse—more like 90/10. On Facebook for example, about eighty percent of pages have less than 1000 fans. Only four percent have 10,000 plus fans. 0.047 percent have a million fans or more. The Atlantic published an article in 2014 entitled;

The Internet Is the Greatest Legal Facilitator of Inequality in Human History.⁹

Our rulers know about this. Buried in the website of the White house itself lurks a presentation developed by the highly credible MIT entitled 'Race Against The Machine'.¹⁰ Their most revealing

⁶ <http://www.rushkoff.com/books/throwing-rocks-at-the-google-bus/> I was unaware of his title before formulating mine, and promptly wrote to him. He assures me mine is a different bus.

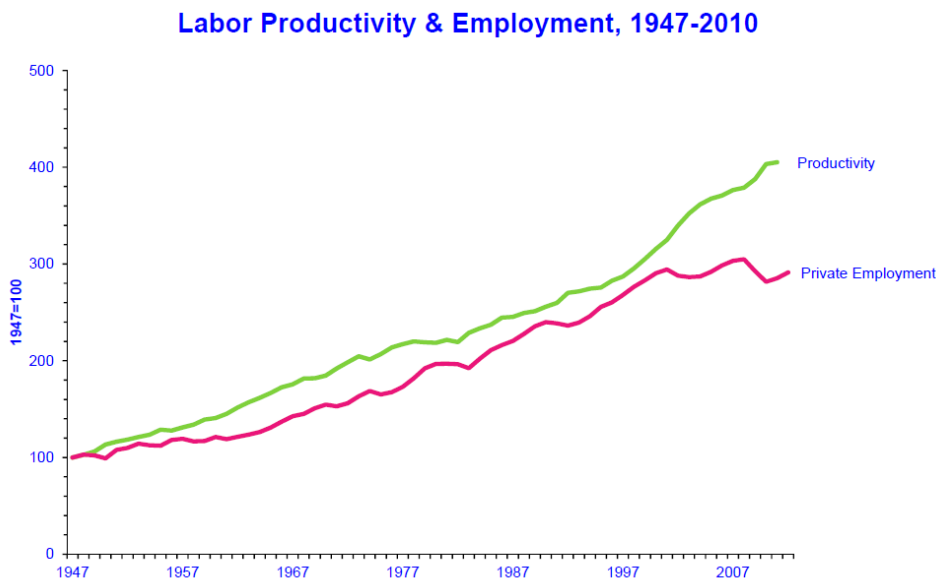
⁷ Bollier, Power Curve Society, p. 35.

⁸ Ibid, p. 32.

⁹ <http://www.theatlantic.com/business/archive/2014/01/the-internet-is-the-greatest-legal-facilitator-of-inequality-in-human-history/283422/>

chart is shown below, and illustrates an actual trend—productivity is rising, but employment is now falling. It questions those earlier assurances that jobs will be created through the new digital economy.

I do not see national leaders brandishing this chart. I do not hear high level questions about the ability of digital disruptive strategies to create jobs. I only hear mid or ground level chatter. Yet our captains know it is a serious issue.



It gets worse. There is a parable in the Information Technology industry about the inventor of chess. The Emperor of China was so pleased with the creator of the game that he offered him any reward he wanted. The inventor asked for a gift of some rice. One grain was to be placed on the first

square, then doubled to two on the next, to four on the third square, etc. We all know the power of logarithmic expansion, and the millions of tons of rice you get by square sixty four. The saying in the I.T. industry is, “so far you’ve only seen the first half of the chessboard.”

Our task is further complicated by our networked world. We are reliant on, and indeed addicted to, the interconnected globe. Our planet was apportioned amongst 196 nations in 2016, a number that has always altered, and will continue to change. Among them are a few large countries, and many small ones. Most small ones walk amidst elephants, hoping not to be trodden on, but stay with the herd because they’ve been told it’s the best strategy to reach the next water hole.

I live in one of these small nations. It looks like a miniature of the most powerful one, the one purportedly leading the herd. Here are four reasons why they’re similar¹¹, and one glaring difference.

1. We’re both recent start-up nations from immigrants who overpowered existing native populations and environments. That’s history.
2. We speak the same language and play similar sports, have the same fast food chains, and watch the same movies. That’s culture.
3. We are both classed as true democracies by The Economist, and only twenty nations are in that list. That’s politics.
4. Both are called rich nations, while most of their inhabitants don’t think they are. That’s money.

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https://www.whitehouse.gov/sites/default/files/microsites/ostp/PCAST/PCAST_May3_Erik%20Brynjolfsson.pdf

¹¹ Many New Zealanders will dislike this claim, but the comparison is made both within, and outside of the OECD. Most Americans probably find the observation ‘cute’.

5. But the United States of America has 320 million citizens, while New Zealand has less than 5 million. That's numbers.

In 2016, over half of the world's population lived in just eight nations. We could call them large, but only one of them is a 'rich nation.' At the other end of the scale, more than 150 of those 196 nations have populations under thirty million. Most of these countries are being disrupted by the digital revolution because most are globally connected.

Or are they being disturbed? Even with the hype of conferences, start-up competitions, and innovation labs in most New Zealand universities, does size matter?

National population size definitely shapes average business size. In the USA, a Small to Medium Enterprise (SME) Food Manufacturer, a winery, and a Wood Window and Door Manufacturing firm, are all defined as being less than 1,000 employees.¹² Many company types need to employ more than 1,500 people to escape the SME tag.

The official definition of SME in New Zealand is 19 or less employees. 99 percent of NZ businesses employ under 50 people. The majority of those tiny enterprises rely on the most recommended marketing technique of all – Word of Mouth. They rarely have sophisticated sales strategies. And in a world cluttered with social media, can a plumbing firm in Tauranga be brought to its knees by derogatory Facebook comments? That can and does cause enormous corporations to tremble, but not the plumber with his smartphone. Yet the digital impact is happening—the plumbing boss no longer checks all completed jobs—he examines before and after smartphone photos from his employees. Perhaps it is beneficial after all.

Other questions from size and interconnectedness surface too. Think in terms of a downsized country. If you had to minimize your nation, what would you subtract or be unable to do? That's particularly pertinent in a highly interconnected world—the answer is that you find it harder to monitor outcomes of being highly interconnected.

For example, small countries cannot replicate the US Food and Drug Administration (FDA), which has an annual budget exceeding four and a half billion dollars. The FDA is the biggest organization in the world telling us whether, say, sunscreen is harmful. Small nations don't have drug auditors the size of the FDA. Frequently the best they can do is test significant imported medical products or food, and there are obvious reasons why—if pills weren't tested, and a bunch of consumers died, so would the governing political party. A small nation might not test sunscreen, which, by the way, often contains questionable additives. So they rely on FDA testing, or that of another larger country.

Nor do small countries attract the headquarters of global companies. The big digital five, Google (under its parent company, Alphabet), Facebook, Microsoft, Amazon, and Apple, all reside in the USA.¹³ Boutique nations may yearn to give birth to such entities, but this might not be such a good idea. If you calculate the average sales and workers of the digital five, they only employ one person for every million dollars of sales. They themselves are the worst advertisement for the claim that the digital world will create many jobs. Wal-Mart, the retail empire in the USA, employs one person for every two hundred thousand dollars of sales.

Perhaps small is beautiful. Perhaps our petite business ethos and personal connection type commerce will sneak under the digital storm. There are other advantages in being tiny too—New Zealand never made cars. We have no rust belt from losing that industry offshore. In general, a small

¹² U. S. Small Business Administration: Table of Small Business Size Standards

¹³ This alone shapes the thinking of both their proponents and their detractors. Small nations do not factor in.

nation, with fewer resources, will focus on core issues and opportunities. New Zealand concentrates on certain agricultural sectors where it perceives international advantage. Mind you, Finland tried that with mobile phones, and it proved transitory. All these are pros and cons of interconnectedness for small nations. Larger ones have the advantage of wider industrial bases, but they still lose in some sectors.

At present these core issues do not include worrying about whether New Zealand children spend too much time swiping touch-screens to the detriment of learning how to conduct a conversation. We're not really sure whether that is a problem, so a small nation leaves it alone. It might throw small money at a Ph.D. research topic, but that's about it.

If you're a large nation, resources permit more of that, and it is true of our chosen big country. The USA does ask such questions, and certainly runs wider national and global surveys. In fact this large nation once funded a government department dedicated to this task. It had a background stretching back to the 1930s, and the 1972 iteration was called the Office of Technological Assessment (OTA). The OTA played a sophisticated role with roots stemming back to the medieval court jester—the OTA could point out the king's folly to him.

Unfortunately that didn't work for the OTA, and following criticism of the Strategic Defence Initiative¹⁴ of the 1980s, it fell from favour and was eventually axed—which could happen to a court jester too. We shall return to this point, because since 1995 no dedicated, significant institution in the USA conducts Technological Assessment. In other words, even the large nation is questioning digital disruption less.

None of that stops Westerners, let alone any other cultural or economic grouping, having those coffee table or village square opinions. However, wherever those discussions occur they are complicated by the nature of multiple, simultaneous disruptions. In May 2016, the newspaper informed New Zealanders that school entrants were becoming harder to teach as many start without having mastered basic talking skills—because their parents spend too much time on their smartphones. New Zealand parents might have raised that with each other over breakfast, and jointly blamed the government or the education system or Apple or Google, then off they went to their busy day. By evening, a fresh batch of news had arrived to distract them.

If only they could hit a gigantic pause button, and concentrate on a single topic, that would be great. If only those parents had time to focus on a single disruptive issue, maybe they could make some thoughtful headway. But the news media who told them about the kids in the morning are facing a “force 12 digital hurricane”¹⁵ of their own, and those media channels load new topics on our wavering attention span every evening in order to save their own jobs.

Societies long ago did not have multiple, simultaneous, disruptions rearing up in front of them—mostly there was only one. When the stirrup came to Europe around the eighth century, it was a rare breakthrough in riding horses. The stirrup altered warfare by allowing a warrior to literally stand on his mount, and use both hands to swing a heavy sword. That disrupted a cavalry without stirrups. The stirrup was not upgraded to a new generation version every two years after that. Outcomes slowly rippled across the world as it settled into place as a part of ordinary life. I can visualise an old man talking to his grandchildren about when they first started using the stirrup—and nothing else new had been introduced into the village in his entire life.

¹⁴ Known euphemistically as the Star Wars program.

¹⁵ <http://www.independent.co.uk/news/media/alan-rusbridgers-resignation-letter-in-full-a7027856.html>

It's enlightening to review such episodes because they were discussed more. Somehow, despite all our labour saving devices, it was they, not us, who found the time and space to do that. Not only that, but since the event was isolated, its potential effects could be seen more accurately. Today, with multiple disruptions looming up at us, it's much harder to assign effect back to cause in a wider social setting. Scientific research into change caused by many factors is difficult. Why, there is a whole new marketing science developing to find out which of the new, multiple, digital marketing efforts, actually moved you to buy that new shirt. Given that marketers now simultaneously advertise through banners, streaming television, Internet sites, social media, review articles, email, sponsorship sites, GPS based smartphone alerts, advert embedded free apps, and more, it's not hard to understand why they don't know which channel worked.

So those busy parents are not going to attend a local interest group discussing the impact of the smartphone on their pre-schoolers. Perhaps they wish the government did, or that somebody would make a television programme about it, but then they also understand the news media faces their own disruptive threat as well. And so the topic dies down again, and nothing is done.

That needn't be the case, by the way. Occasionally people do get together to wrestle with these topics. That is precisely what a group of ordinary British people in Birmingham did, and once they had sorted out their ground level opinions, they went off to Parliament to present them—and were applauded for doing so. The founders of Uber are hardly like to drop in on such a group, and this is a major point as well. These ordinary citizens were not invited into the board rooms of angel investors who fund disruption. They did get into the chambers of politicians, who have far less power to change scenarios than we think they do.

It's time to look at definitions.

Defining digital disruption

Digital man goes straight to Google, which will answer any question faster than a Greek oracle. Topping my search phrase 'definition digital disruption' was the following paragraph;

Digital disruption refers to changes enabled by digital technologies that occur at a pace and magnitude that disrupt established ways of value creation, social interactions, doing business and more generally our thinking.¹⁶

Considering the warning about 'our thinking', that definition is a reasonable start. Ironically it was at the top of a search list from a product developed by one of the great disrupters of our time—Google. On the other hand Google hopes their search engine will become;

.. the third half of your brain.¹⁷

The 'father' of business disruption studies is Clayton Christensen, who wrote a seminal book entitled 'The Innovator's Dilemma'¹⁸ in 1997, which The Economist named as one of the six most important books about business ever written. His definition is;

"Disruption" describes a process whereby a smaller company with fewer resources is able to successfully challenge established incumbent businesses. Specifically, as incumbents focus on improving their products and services for their most demanding (and usually most profitable) customers, they exceed the needs of some segments and ignore the needs of others. Entrants that prove disruptive begin by successfully targeting those overlooked segments, gaining a foothold by

¹⁶ <https://byresearch.wordpress.com/2013/03/07/digital-disruption/>

¹⁷ Sergey Brin, Google founder, 2010.

¹⁸ <http://www.amazon.com/Innovators-Dilemma-Revolutionary-Change-Business/dp/0062060244>

delivering more-suitable functionality—frequently at a lower price. Incumbents, chasing higher profitability in more-demanding segments, tend not to respond vigorously. Entrants then move upmarket, delivering the performance that incumbents’ mainstream customers require, while preserving the advantages that drove their early success. When mainstream customers start adopting the entrants’ offerings in volume, disruption has occurred.¹⁹

The above paragraph is written academically, because Christensen teaches at Harvard Business School. Later in the same article he tells us;

Uber is clearly transforming the taxi business in the United States. But is it disrupting the taxi business? According to the theory, the answer is no. Uber’s financial and strategic achievements do not qualify the company as genuinely disruptive—although the company is almost always described that way.²⁰

From the above opinions it would seem that definitions of digital and business disruption are not agreed upon. Christensen doesn’t seem concerned about ‘our thinking’. And even at the purely business level, at least one writer penned an article with the theme;

Why Clayton Christensen Is Wrong About Uber and Disruptive Innovation²¹

Christensen explains we need to understand the true business theory;

Readers may still be wondering, Why does it matter what words we use to describe Uber? The company has certainly thrown the taxi industry into disarray: Isn’t that “disruptive” enough? No. Applying the theory correctly is essential to realizing its benefits.

That begs us to ask a question—benefits to whom? The founders of Uber could give you several answers. If they employ Public Relations experts, their list will not include the value of their shareholding. Does anyone suffer from the disarray in the taxi industry? Christensen doesn’t directly say. He has a theory of disruption that we must adhere to. However, the disruptive evangelists use evasive terms as well. You need to interpret the techno-speak. For example, we read earlier in this chapter about disruption that;

... the Holy Grail is to develop a digital platform that redefines traditional market structures and displaces conventional value streams.²²

The phrases, ‘redefines traditional market structures’ and ‘displaces conventional value streams’, are jargon terms for firing employees. Those employees mostly work for someone else, so that frees the disruptive venture from any angst. One of the classic disruptive case studies is the demise of Encyclopaedia Britannica, which was the world’s most widely known, printed set of books about everything. They were undone by Encarta, a free, lower quality CD based Encyclopaedia, that Microsoft bundled with PC sales in order to assist sales of core Windows products in the 1990s. Dad pushed the home PC purchase past Mum by arguing it came with a free encyclopaedia to help the kids with their homework.²³ Sales of Encyclopaedia Britannica plummeted.

Microsoft neither knew nor cared about the employees of Encyclopaedia Britannica. They were mostly in another country. But the lives of the employees, salespeople, and owners of Encyclopaedia Britannica were disrupted. More jobs were lost in Britannica than were created in the Encarta

¹⁹ <https://hbr.org/2015/12/what-is-disruptive-innovation>

²⁰ Ibid.

²¹ <http://techcrunch.com/2016/02/27/why-clayton-christensen-is-wrong-about-uber-and-disruptive-innovation/>

²² <https://www.businesstink.unsw.edu.au/Pages/why-everyone-wants-to-be-the-next-disrupter.aspx>

²³ One of the biggest cons ever. As soon as the PC arrived home, the games went on.

division of Microsoft, which helps explain why they effortlessly ditched their encyclopaedia once it had got Windows PCs into millions of households.

Well, we're going to widen the circle of disruptive activities throughout this book to include the disrupted, and reinterpret some of the phraseology used; after all, not even the experts can agree on what it means; and secondly, using the rear-view mirror in the bus, we can examine previous disruptive episodes and find out what actually happened. The history of disruption is an eye opening exercise. We will deliberately draw events you might not have considered disruptive into the equation because they give us insights on outcomes. E.g. we will see how colonialists disrupted millions of lives, to paraphrase Christensen, by;

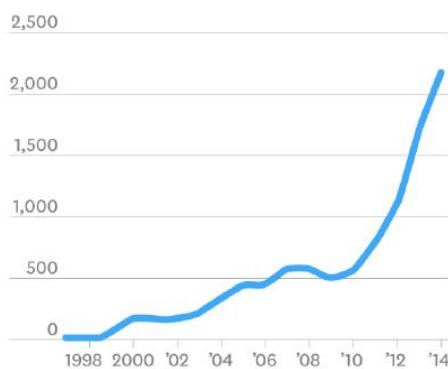
Focus(ing) on improving their products and services for their most demanding (and usually most profitable) customers, they exceed(ed) the needs of some segments and ignore(d) the needs of others.

I make no apology for looking back on previous disruptions. Hopefully it prompts us to consider outcomes for the losers as well as the winners. If there are disrupters, there are disruptees. If something is gained, something is lost. Our economic system sometimes rewards the disrupters, but who looks after the disrupted? If their incomes are lost, that is not borne by the disrupter, but it is nevertheless a cost. Microsoft did not see to it that unfortunate Britannica ex-personnel were looked after. At best, Britannica bore the loss themselves, at worst, the taxpayer does.

The Harvard Business School tells us something else that is pertinent, considering the lack of

The Ubiquitous "Disruptive Innovation"

"Disruptive innovation" and "disruptive technology" are now part of the popular business lexicon, as suggested by the dramatic growth in the number of articles using those phrases in recent years.



SOURCE FACTIVA ANALYSIS OF A WIDE VARIETY OF ENGLISH-LANGUAGE PUBLICATIONS FROM "WHAT IS DISRUPTIVE INNOVATION?" DECEMBER 2015 © HBR.ORG

direction from our rulers, and the formal demise of Technological Assessment. It is illustrated by the next chart which measures how often the phrases "disruptive innovation" and "disruptive technology" are referred to in articles. From a virtually zero start in the late 1990s, it soared to well over two thousand by 2014.

The world now talks freely about disruption, our final proof being that it gets scooped up by companies you might not expect. Oakley, a world player in eyewear, used 'Disruptive by Design' as an advertising mantra in 2014.²⁴ Colin Baden, Oakley CEO, claims;

"This is the beginning of a new era of brave design and disruptive technologies from Oakley."²⁵

I'm unclear how new sunglasses are disruptive, but that's not the point. Rather it is that the phrase must be trendy because we were alerted to this by the CEOs claim that they were brave. As marketing terms, 'new era' and 'brave' rank up there with 'passionate' and, yes, 'evangelist'. Both the phrase

tracking chart and the Oakley type announcements tempt us to think disruption is new. Other words, such as 'frontier' and 'groundbreaking' often accompany product releases today. All of this infers something we were warned against a long time ago;

²⁴ <https://vimeo.com/96062129>

²⁵ <http://www.luxottica.com/en/oakley-disruptive-design-now-and-forever>

What has been will be again, what has been done will be done again; there is nothing new under the sun. Is there anything of which one can say, "Look! This is something new"?²⁶

Don't dismiss this with a wry laugh, asking where King Solomon kept his smartphone. He is not talking about a specific device. He is reflecting on society. Keep his premonition in mind as we look back at previous disruptions that didn't use the fraudulently 'new' D word.

Even so, Solomon himself may have been amazed at the speed and distribution of disruptive technologies today. Let's look at the fifty million user list to illustrate this. Simply put, how long does it take an innovation to reach fifty million users? We don't know how long it took the printing press to reach fifty million readers because that device was invented prior to the recording of statistics. It must have taken more than two hundred years in the Middle East as we shall later learn though.

The telephone, an early entrant disrupting the communications industry, took seventy five years to reach fifty million users.

Radio followed, taking thirty seven years.

Television thirteen years.

The Internet four years.

Hotmail, the first free web based email system, eighteen months.

We'll pause here, firstly to reflect on the shortening time frame. True, one can argue that some of these inventions took advantage of infrastructure introduced by previous ones. Nations did not need to build the first Internet network of wires because the telephone industry had already installed that.

Secondly, all those inventions look useful, and there are practical reasons why people would take them up rapidly. Mind you, in hindsight, the printing press should have been snapped up too. But it wasn't. In other words, I'm suggesting the rate of resistance against new innovations has lessened.

Thirdly, we're not sure whether they are all disruptive devices, and I deliberately repeated myself then because something smashed all those records in 2012. The current winner may not technically be disruptive, but it's in the list to illustrate another factor, which I'm making a related suggestion about—our declining resistance to disruption is allowing anything through the filter, whether useful or not.

As if a grand statement of our time, the current winner to fifty million users, taking only thirty five days, is the smartphone game, Angry Birds.²⁷

Let's begin our bus journey by joining Plato, around 400 BC, discussing the technology of books.

²⁶ Possibly King Solomon, 1000 BC, recorded in Ecclesiastes 1:9-10

²⁷ It is said that 500 man years of time are wasted every single day playing Angry Birds.

Chapter 2: Plato to the Ottomans

Chapter 3: Colonial disruption

Chapter 4: Environmental disruption

Chapter 5: Shrinking distance

Chapter 6: Shrinking wealth

Chapter 7: Shrinking minds

Chapter 8: Shrinking freedom

The Pledgeme site

<https://www.pledgeme.co.nz/projects/5244-on-the-digital-disruption-bus-without-a-driver-the-nz-book>