VFQ Value Flow Quality

Why change?

by emergn

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INTRODUCTION

All organisations – you might say all organisms – need to change in order to survive. The world around us changes, our competition changes, and we must change too. The rise of technology in the last few decades has generated enormous disruption and significantly increased the rate of change. Just as the invention of the printing press spelt the end of the once-flourishing industry in manuscript creation and illumination, so the internet has thrust enormous change on businesses as diverse as travel agents, music retailers and publishers. Those who are unable to adapt their business models will face stronger challenges in the next few years.

There have been many famous examples over the last few years – but consider book retailing in particular. When Amazon began offering books online in 1995, it was a tiny operation. Even though it grew swiftly, it famously did not turn a profit until 2001. Many thought that such a business model was unsustainable. Traditional book retailers recognised Amazon as a threat, but dealt with the problem in different ways. Barnes and Noble tried suing over Amazon's claim to be the 'world's largest bookstore'. In 2001, Borders handed over the online portion of their business for Amazon to host and run; Waterstones followed suit – two retailers effectively handing control of a growing sales channel to their main competitor.

Figure 1. A traditional book retailer

The move seems bizarre – but of course, to the two companies, it didn't seem that they were doing anything peculiar at the time. Online retailing was seen as being a 'non-core competency'. The companies were in the business of selling books, it was easy to convince themselves that Amazon was merely a logistics and fulfilment house, not a credible rival. They never undertook the changes that would have made software a core competency and they fatally underestimated what impact on customer habits this new distribution channel might have. Customer behaviour, it turned out, could change quite easily.

In 2010, 32% of frequent book buyers purchased books by browsing in physical stores; by 2012 this had reduced to 20%. At the same time, those who bought books by browsing online hardly moved from 6.2% to 6.6%. It was clear that customers were happy to make purchases without browsing the physical book. Alternatives in online retailing could take their place: peer-to-peer reviews; bestseller lists; promotions; 'other customers bought' recommendations and reading extracts. In 2007 Amazon launched the Kindle e-reader and once again revolutionised the retailing of books. In 2014 Neilson reported that 70,000 books were purchased globally in a digital format - twice the number purchased in 2011!

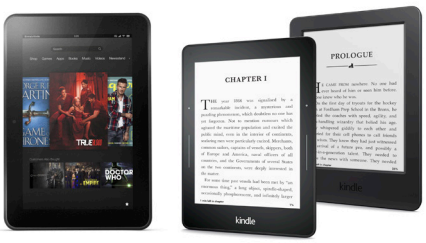

Figure 2. Amazon's Kindle e-readers

By the time e-readers and the growing opportunity for selling books themselves in a digital form took off, Borders and Waterstones had back-pedalled furiously, taking back control of online selling, albeit without notable success. Borders partnered with Kobo, while Waterstones eventually agreed to sell Amazon's Kindle, and Barnes and Noble created the Nook.

You may already know part of the end to this story. Borders filed for bankruptcy in 2011. Barnes and Noble is struggling with declining market share and disappointing sales of its e-reader. Waterstones has also struggled; closing stores and repeatedly issuing profit warnings. Whether physical booksellers can survive outside of highly specialised niches remains to be seen.

Booksellers often point to the problems with online retailing of books – the lack of a social aspect to browsing, the difficulty of getting trustworthy recommendations, or finding something amongst the endless possibilities. But while the problems are there, the answers are likely to come from new software companies, not a return to traditional retail. Netgalley permits pre-publication sampling for reviewers while still keeping control of digital content; Goodreads (purchased by Amazon) and Rabble provide more effective peer-to-peer recommendations, and sites like Bookish offer better-informed curation of books, helping select books more intelligently than through crude 'also bought' data.

You can trace the same story for numerous other industries – for much of retail, photography, gaming, entertainment, marketing, recruitment, financial services, telecoms... As Marc Andreessen, the co-founder of Netscape, entitled his influential article for the Wall Street Journal: 'Software Is Eating The World'.

Rapidly changing markets, fuelled by disruptive technology, are forcing businesses to change direction quickly whether they want to or not. This doesn't just effect what they build or how they market it, but in the people and technology processes that support the business.

Now compare that truth to the way most transformation initiatives are run. Working to multi-year plans in excess of two years means that many ideas risk being redundant before they are even launched... At a time when the ability to respond to change is more highly prized than ever, many projects are characterised by inflexibility, long lead times and a cost that magnifies the risk of failure.

> "If you are not moving at the speed of the marketplace you're already dead – you just haven't stopped breathing yet."
>
> **Jack Welch**

The last decade has seen attempts to deliver projects faster, in a more flexible way that can cope with change. This education programme will discuss exactly how this has been done and how your business could do the same. But before we consider the ways in which we can improve, we need to look at why changing the way we develop products and services is imperative. Perhaps even more importantly, we need to ask ourselves why we find change so hard.

By the end of this session you will:

1. Recognise the scale of issues in how we deliver products and services.
2. Understand the challenges of using projects as a mechanism for delivering change and meeting customer expectations.
3. Identify flaws in focusing on an iron triangle of cost, time and scope.
4. Have a brief overview of the history and philosophy behind 'Agile' development.
5. Understand how people's intuitive ways of thinking create rules of thumb.
6. Appreciate the negative impact of rules of thumb in the way we deliver today.
7. Realise how new initiatives can be developed through faster feedback.
8. Discover and use three new guiding principles to break the iron triangle.

1 HOW DO WE PERFORM TODAY?

If you talk to any business leader – no matter how diverse their business – you will find that they all have very similar fears and the ambition to work better, faster, cheaper. They are all too aware that in order to beat the competition they must first win the hearts and minds of the customer, and more quickly than anybody else. The problem is that we think we are doing all the right things to achieve our goals, when in reality; we might be stuck in a redundant mind-set.

1.1. The challenge

The choices for our customer are increasing and changing on a regular basis and not always in a like-for-like way. In that deciding moment when someone plans to make a purchase, who's really to know what they will choose or the reason why? Our challenge is getting the right products and services out there to win over the customer. If we want to remain competitive in an evolving marketplace, then that process depends upon adopting new strategies that help us to collaborate and engage with customers quicker than we have done in the past. Countless departments and minds power a business; how well they work together will determine their success.

1.2. Lacking in innovation

All the great management thinkers – from Jack Welch whom we quoted in the introduction to Peter Drucker, 'the founder of modern management' – stress that innovation is the engine that keeps business running. Without it, we die. Yet for some reason, many of our projects and initiatives are run in a way that removes the necessary conditions that allow us to constantly collaborate and innovate. Innovation does not just happen. Nor does it only happen hived off in an isolated 'creative lab'.

Technology departments are often cited as the key area for innovation within a business and we are quick to believe that our dependency on it is unique to the 21st century. Yet, if you investigate, you'll see that technology has powered our industries for many past centuries. For instance, back in 1455 Gutenberg invented the print press and created the first ever hard copy of the Bible – Ancient Egypt provided us with early evidence of chemical manufacturing to form paint pigments. Fast-forward 5000 years to today and we arrive at the age of satellites and smartphones. The difference now is that technology is so pervasive that some form of it underpins almost everything we do – publishing a magazine, designing a building, curating a fashion show, developing a marketing campaign, producing a video game. Since technology and creative work are becoming increasingly intertwined, we go into a range of examples of this throughout the course of VFQ learning.

Eric Lundquist interviewed a mix of IT and non-IT professionals and discovered a divide between how IT people thought of their department, and how they were viewed by everyone else. When asked if business users were happy with the quality, timeliness and cost of IT projects, two-thirds of the IT professionals said yes, but only half of non-IT professionals agreed. But, is the issue here about the divide between business and IT or, is it more symptomatic of how complex projects perform?

We can't blame all of our mistakes on technology. It is an easy scapegoat but we must admit that failure is often down to people and how we interact – poor management, miscommunication, lack of direction, weak marketing strategies, design flaws. The list goes on. Projects failed not because of technological changes, but because of challenges in the way we work.

In fact we could best sum it up as 'all issues are people issues' and a lot of these are exposed in the way we run projects. Even calling them projects suggests they have a finite timespan, when in fact, once most products and services are launched, they still benefit from continuous improvement. For instance, in 2011 the department store chain JCPenney appointed a new CEO to combat years of poor financial results. They chose none other than Ron Johnson, the executive responsible for the huge success of the Apple retail stores – a company famous for their 'no discount' strategy.

Johnson set out to fix JCPenney in the same way, removing the discount coupons and clearance sales that had kept loyal customers coming back, and replaced them with static 'every day' price tags. Customers were outraged by the disruption to their strategy of bargain hunting and planning purchases around sale times. The result was immediate – a net loss of $1 billion and a devastating 28% drop in revenue for 2012. It will come as no surprise that poor decisions cost the CEO his job. We empathise with Johnson under the realisation that he was acting on past experience, but unfortunately his first great success did not follow with another. Innovation was simply applied in the wrong way.

Figure 3. JCPenney department store

1.3. Slow and expensive

At some point we will all feel the tremors of a project obliterated beyond repair so we need to prepare ourselves and understand the impact this can have on our businesses. Some blunt measures below provide an illuminating snapshot of our current performance. The Standish Group's CHAOS Report judged projects as:

- successful – those which complete their agreed scope on time and on budget
- failed – those which were either cancelled, abandoned or failed to meet any real objectives
- challenged – projects that suffered either a major overspend, lateness or failed to deliver agreed functionality.

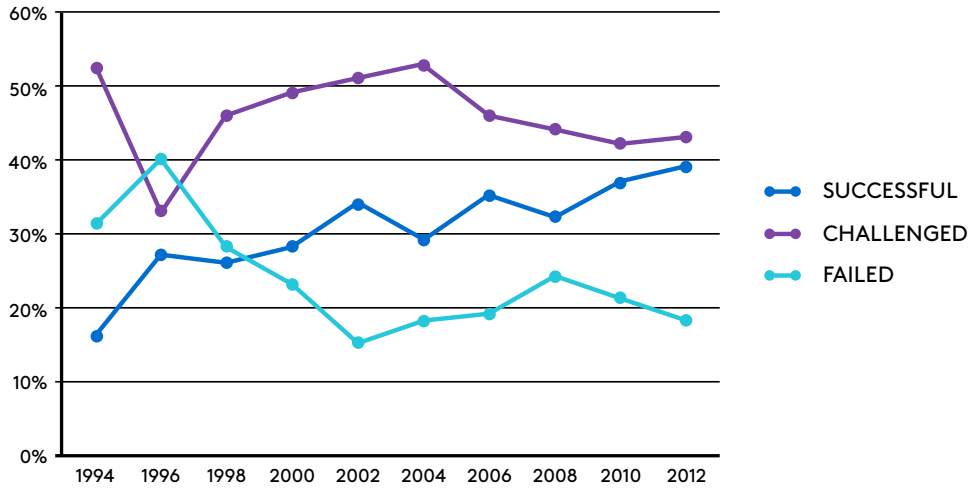

Figure 4. The Standish Group's CHAOS Report results from 1994 to 2012

As you can see from the graph, the CHAOS Report paints a fairly miserable picture. Through over a decade of learning, we appear to be making gradual improvements, but the fact remains that around one-fifth of our projects are still failing. It's true that we could argue with some of these measures. After all, if you find out that a project isn't going to do what you hoped it would, then cancelling it should probably count as a 'success' not a failure – depending on how quickly you make the call. If you decide half way through to add more features, for example, then you would expect the project to take longer and cost more. The very definition of success – on time, on budget and on scope – is one we'll go on to challenge later. Of course these are only statistics, but who hasn't seen failures of this scale first hand and felt the pain that comes with them? We continue to miss the opportunity to increase value. Why would we settle for any less than the results we are capable of?

The CHAOS Report isn't the only study to paint this picture. A 2012 Mercer report damningly judged that 72% of projects cost more than they returned in value. The 2013 PMI report confirmed that success rates have been falling since 2008 with less than two-thirds of projects meeting their goals and about 17% failing outright. Furthermore, Gartner claimed that 50% of IT projects are rolled back out of production.

Just to give you an idea of the financial impact of these problems: Forrester Research put the annual cost of project failure to US business at $30 billion. The global cost is mind-boggling. IT is supposed to account for 50% of capital expenditure – that's $2 trillion a year. Given the value of capital expenditure and the possibilities of what businesses could do with the money, it's pretty devastating that, according to Mercer, only 28% of that delivers value. Can you think of many businesses that are happy with only 28% of their work delivering any value at all?

It's not just IT projects that incur these costs, the age old saying 'time is money', used by Benjamin Franklin to pull up a labour worker during his fifth tea break of the day, is a mantra for business of any sort. The Channel Tunnel was built below sea level to create an express train link between the UK and France. It took 20% longer to build than estimated, sending costs soaring 80% above budget. The English and French 'tunnelled' from opposite ends of the channel, which made clear communication rather difficult. This, plus changes to the original design to follow regulations (who knew air conditioning would be a necessity under water?), plagued the project. Wembley Stadium in London was finished a staggering five years after the planned completion date. The steel arch, destined to be the iconic trademark of the home of English football, was also ironically its downfall. Cramming a highly innovative piece of engineering into a regular build timescale caused complications, so time pushed on and higher costs ran with it.

So regardless of the industry, technology-based or otherwise, it's evident that outcomes typically remain hard to predict and projects are increasingly difficult to manage. The effect of errors, however, remains the same – delivery time is slowed down whilst costs appear to increase twice as quickly.

1.4. Multiple failures

Rather than being made visible so that we can learn from them, most of these project failures are hidden – carefully swept under the carpet to avoid retribution from managers inside and shareholders outside the company. Indeed, if most of us examined our career history, we would have to admit that there are more failed projects scattered along the way than we would like. Occasionally, however, they can be made very public – either because the money lost mounted to the point where companies were forced to inform investors, or because there was a direct impact on customer service that attracted significant attention.

Among these misfortunates are some of the biggest names in business – names with significant financial backing and a competent workforce, yet whose innovations failed dramatically. Infamous examples include Gap's re-brand, which cost an estimated $100 million, only to revert back to the original logo six days later following a storm of negative reactions; the development of the Boeing 787 aircraft fleet that came in three years late with a $12 billion overspend or the Taurus system for the London Stock Exchange, which took 10 years, cost £500 million and delivered no value.

In 2014 Spider-Man: Turn Off The Dark entered the spotlight as Broadway's biggest overspend. The show directed by Julie Taymor (famous for her box office smash hit The Lion King) and music by rock legend Bono sent expectations soaring. Broadway explored new realms of technicality in the 'comic book, rock opera circus', causing the rehearsal and preview periods to go on for much longer than planned. During this time, Taymor reported 'a tremendous amount of creative commotion behind the scenes' involving frequent changes to the script, score and cast. The complexity of the stunts caused several broken bones and concussed superheroes from failed safety harnesses and tumbling equipment – ending with a fine of $12,600 for safety violations.

When previews began in November 2010, the show became the brunt of media jokes. Actress and comedian Joan Rivers began her stand-up act with a 'moment of silence' for 'those Americans risking their lives daily – in 'Spider-Man' the musical'. Host Conan O'Brien suggested they use 'Silly String' for web-slinging stunts to cut costs. The Simpsons even paid homage with an episode featuring 'Radioactive Man' and his many disasters in a musical performance. Furthermore, critics sunk their claws into the plot, where new characters were chaotically grafted into the original storyline. The creators responded to the backlash with a second version of the show. The New York Times described the re-release as a leap from 'jaw-dropping badness' to 'mere mediocrity'.

Mounting pressures and the time overrun pushed Taymor and two of the leading cast members to resign in March 2011, calling for last minute replacements. Despite the turbulence and criticism, the show finally opened to the public with strong sales in June 2011. By January 2014, sales had declined and the cast were refused any further injury insurance, so the show closed its doors. In the end, the cost of producing such an overly ambitious spectacle totalled $75 million, with a $60 million loss to investors.

From Broadway to blue chip, another disaster was Coca-Cola's launch of 'new Coke'. In 1985 the US nation's favourite fizzy drink was replaced by a 'new' version, only to receive 40,000 angry letters and infinite phone calls in protest. Underestimating their customers' sentimental attachment to the soda, Coca-Cola were forced to bring back Coca-Cola 'classic' within three months of the launch date. Does Ford's 1958 'Edsel' car spark a memory? It was one of the most hyped marketing efforts of its time and had the public eagerly anticipating for the grand unveiling. The result was underwhelming to say the least. Every feature was slated – from the name to its poor quality workmanship. Ford sold only 64,000 units and made a loss of $250 million in 1958, comparable to a massive $2.25 billion today.

Figure 5. New Coke – it lasted 79 days before returning to the original formula, now Coca-Cola Classic (© Derek Bruff)

In isolation, Ford produced an impressive advertising campaign and a semi-decent car – but when combined, the result was less than compelling for the customer and the launch was a flop. The real test was with actual paying customers and unfortunately it failed.

Whether it's during the planning, analysis or development stages of a project, organisations suffer immediate costs in fixing problems, intangible costs in terms of lost consumer confidence and negative publicity, and finally, future costs to try to improve the product and create more robust back-up plans.

We have to come to terms with the irrefutable fact that things change over time, and projects don't tend to cater for change very well, no matter how well we plan them out in advance. Part of the problem is that while we focus on scope (a requirement for a business objective), how much it costs and how long it takes, quality remains little understood and effectively becomes squeezed by the other three. A lack of quality is often the key reason behind the problems that later bedevil our products and processes. If features are insufficiently tested, there is not enough attention to detail and the customer is not fully considered, then we must expect future problems. Unfortunately, few companies give all of these aspects the consideration they need. It is also, predictably, easily sacrificed when organisations outsource work and rely on contracts to enforce quality standards.

1.5. Coming full circle

We all want to prevent this fate. Getting our best ideas into the hands of our customers is the priority – we just need to work out the best approach for our own businesses, first by finding the real root cause of our problems.

We are determined not to be seen as slow, expensive and unreliable, so we spend lots of time trying to think of solutions. To try and control being slow, we estimate how long things will take us in great detail and create schedules with deadlines and motivate everyone with a series of measures. We do the same to control cost, while we try and control risk by creating detailed plans and signing off on scope in advance, locking down ideas to ensure we are not destabilised by last minute changes.

Does any of that reaction sound familiar? It is the way we have learned to tackle these problems. After years of seeing this scenario play out over and over again, it is clear that our perseverance and planning alone is not enough.

The problem is that most of it doesn't work. The evidence suggests that in spite of managing to be 'on time'; some departments are still regarded as slow. In spite of hitting a budget, we are still perceived as expensive. This suggests our real measures should be something rather different. We'll go on to discuss these later, but before we do, we need to acknowledge the fact that we are using measures that no longer work – and in turn these are driving negative behaviours.

Activity 1: Do you need to change?

We suggest doing this activity first on your own. Ask a couple of colleagues from your team to do it as well. Then get together to compare and discuss your answers. It can take several days to complete this activity, depending on how much time you devote to digging out information. We genuinely believe that an understanding of where your organisation is now, and how well you deliver projects, will help you greatly in the rest of the course.

1. Speed

Is the process of delivering new ideas to market slower than it should be?

Think of a few examples, from small change requests to large projects. How do you measure this? Are you working to an 'on time' metric or do you measure lead or cycle time?

Don't hide behind a 'service level agreement'! Do you know how fast the sponsor or customer of a particular change wanted it and why? Try and find someone and ask exactly when they really needed the change delivered, when they actually got it and what the consequence was of any difference in the two dates. If you can, try and actually quantify this difference. Ask what costs or sales might have been different if the project had arrived early. Such questions can be a helpful way to flesh out the value of speed or the cost of delay.

2. Cost

Is delivering projects or products more expensive than it should be?

This can be tricky to answer because most of us would like things to be cheaper! Some other questions can help clarify this.

How much value does your department deliver? Again, you want to try and quantify this. Find a recent product and sit down with someone who regularly uses or oversees it. Work together to try and come up with a figure for what the product saves the company, or by how much it boosts or protects revenue. If this is still difficult, think of how much it would cost to deliver the same value by some other means: a manual workaround, a third party... Sometimes it is especially worth investigating a couple of projects – one trumpeted as a success, one acknowledged a failure. Try to look up the original business plan and assumptions before comparing them with reality. What sales and costs were projected? What actually happened?

How much of your budget is devoted to 'keeping the lights on' – the part that might be seen as part of the cost of doing business?

The truth is that few organisations are good at establishing whether or how much value they deliver from their departments or through their projects. Naturally, this makes it much easier to focus on the figure of which we are all certain – how much it costs. Quantifying the benefits of a product in order to justify expenditure is an essential part of our business.

3. Risk

How often do things go wrong? Or what is the risk of them doing so?

Is there a technical element to your business? If so, what kinds of technical glitches could disrupt your organisation? How severe would the disruption be? What workarounds exist or could be implemented to limit the damage? Consider the example of Sainsbury's supermarkets. When their logistics system developed faults at 4 warehouses, stores suffered major out-of-stocks and manual ordering and shelf-stocking were implemented in the short-term. Costs consisted of the extra staffing, lost sales and the cost of fixing the underlying problem.

Think also about the stability of your services. What level of debt are you carrying because of poor quality components being delivered? How stable are your processes that serve customers, how well are they understood by a number of staff and how quickly do people uncover problems to get to a root cause?

When you have made an initial list of the key risks, find out how many have been previously identified and are being tracked and/or managed. To do this, you will probably need to talk to several people outside your immediate team. Ask if there is an associated probability of the risk occurring, on what this is based and how frequently it is reviewed.

4. Discussion

Now you should be in a position to answer more honestly the question with which we began this section: what is the state of business today – but in your organisation. Do you think that business leaders see you as slow, expensive, lacking in innovation and risky?

Commentary:

No-one can consider change or improvement unless they have a clear idea of where they are now. It may be that your company delivers value far faster than anyone expected and without significant risk. We'd still recommend reading on, because you want to make sure you keep on doing that. But for some of us, a look at the department's true record can reveal why that gap exists between how we think of ourselves, and the way others sometimes call us 'slow, expensive and unresponsive'.

2 DOING IT BETTER

> "The dominant paradigm for managing product development is wrong. Not just a little wrong, but wrong to its very core."
>
> **Don Reinertsen**, The Principles of Product Development Flow

When the leading thinker on the subject tells us that the way we do things isn't just wrong, but 'wrong to its very core', we have to sit up and take notice.

There are plenty of books and thinkers with good ideas. And by ideas, we don't mean vague theory, but specific practical actions whose success has been proved within their industry.

Eric Ries, a pioneer in the 'Lean Startup' method, has reinvented the formula we relied on for centuries to boost our profitability. This scientific approach attempts to minimise uncertainty and advocates 'working smarter rather than working harder'. The only way to succeed in a world of uncertainty is to learn faster than your competition, he writes. Ries, amongst others helps companies to move from 'if you cannot fail, you cannot learn' to learn fast, learn often. Dropbox is one of many companies following these principles, and went from 100,000 registered users to over 4,000,000 in 15 months using Lean Startup method.

Ries is not the only one branding failure as a positive. Tim Harford's bestseller, Adapt – Why Success Always Starts With Failure, even advocates this in the title. It is almost impossible to imagine yourself openly embracing failure, particularly when success depends on our precious time and restricted funds. But it's true that most great ideas and companies have risen from previous failures.

Figure 6. Giving up before you even start

In his best-selling book The Checklist Manifesto, surgeon, writer and public health researcher Atul Gawande reveals that the issues in modern medicine and the bugs plaguing virtually every profession today are largely one and the same. Surgery and medicine are complex subjects and it is often unclear what a surgeon is going to find when they operate on a patient. But today the same can be said for most of us in our nine to five jobs – who really knows what's around the corner? Along with retaining libraries of knowledge, the real challenge in medicine is getting teams to work together effectively without wasting precious resources.

Gawande's faith in checklists does not stem from the satisfaction of ticking a box or following a manual. In fact, the list acts as a catalyst for communication – it encourages collaborative working and alignment, and urges users of the checklist to engage with the subject matter. The list frees capacity so we can think ahead and ultimately minimise failure. There are basic points on the list such as 'make sure an antibiotic is given' or 'make sure blood is available for a risky case'. There are also many personal points rather than medical. One is getting members of the operating team to introduce themselves before surgery. Gawande explains that if a person has said their name, then they are more likely to speak up during the surgery when they have a problem or any doubts. The checklist method has been implemented in 20% of US hospitals. Complications have dropped by 36% and number of deaths by 50%.

You'll find that all of the industry specialists advocating new ways of working have had their fair share of successes and failures, discovering what works by experimenting in their own context. Following their methods step by step, may help, but the real value will come in the way you adapt and apply these practices within your own context.

2.1. The rise of the knowledge worker

In 1959, Peter Drucker stated that: 'The most valuable asset of a 21st century institution, whether business or non-business, will be its knowledge workers and their productivity.'

Say you work as a magazine publisher and come across a change method that appears to focus on a software development environment – it's likely that you will stop reading into it. It is logical to want to focus on teachings around your area of work and expertise, but the problem is that this may reduce your chances of finding the process that will work best for your organisation. We need to realise that we all have the same traits and so a method we apply to one field can be reframed to suit another.

The theory of Human Interaction Management states that there are five principles characterising effective knowledge work:

- Build effective teams
- Communicate in a structured way
- Share and maintain knowledge
- Align your time with strategic goals
- Negotiate next steps as you work

Anything from product development, to writing a play, to developing a closing speech as a barrister involves these actions and so they all constitute knowledge work. In fact, so does anything that warrants a project team.

As knowledge workers we bring benefits to organisations in many important ways; we create and modify strategies and assess input to evaluate complex or conflicting priorities. We have the ability to think both convergently and divergently. We understand cause and effect – the key to solving problems. These are all rich assets, but the overarching value we derive from knowledge work is in the relationships that are formed and the ideas that are inspired through communication and collaboration.

Projects are created as a way to develop ideas into parts that are useful to our business. They are the standard method for turning 'concept in to cash', which means that they are knowledge-working environments. However, they may not be the best vehicles for transforming great ideas into value as the complexity of these environments increases with every new product and person that comes into it.

Organisational theorist, Ikujiro Nonaka put it nicely, describing companies as 'growing organisms' rather than 'controlled machines'. He predicts that the issues we face are due to the fact that most have been viewing knowledge as a 'static input to the corporate machine'. This links well with Steve Johnson's idea in Where Good Ideas Come From that we need two or more 'half ideas' to collide in order to be genuinely innovative. The cross-pollination of ideas from one discipline to another is becoming more and more common as people realise that knowledge work occurs in many walks of life. So in order to realise true value, we need to accept a creative way of thinking and learn from other fields.

2.2. Learning from software

Software is an area that has given rise to lots of innovation over the last few years. This isn't entirely unexpected given the sheer amount of investment in technology and software across all industries. Many of these ideas have been collected up into methodologies – some might even go as far to say, philosophies – and given names like Scrum, Agile, Lean, XP, Systems Thinking and Kanban. You might have heard of some of these and you may even have tried them out or attended training courses on them. Perhaps you've seen some good results, but also probably some failures and disappointments.

The Agile Manifesto was first signed in 2001 by a group of 17 developers to define an improved way of developing software using more lightweight methods that are still followed today. The manifesto was written with software in mind, but it undoubtedly illustrates strong principles for every industry to follow. The opening statement was:

THE AGILE MANIFESTO

We are uncovering better ways of developing software by doing it and helping others do it.

Through this work we have come to value:

Individuals and interactions over processes and tools

Working software over comprehensive documentation

Customer collaboration over contract negotiation

Responding to change over following a plan

That is, while there is value in the items on the right, we value the items on the left more.

It is a philosophy with a great deal of appeal – improvement through practical experience. It's followed by 12 principles that go on to enshrine delivering value early and often, using feedback to respond to change, focusing on quality, and understanding that people with good communication skills and the ability to collaborate are required as much as excellence of engineering and structure.

PRINCIPLES BEHIND THE AGILE MANIFESTO

We follow these principles:

- Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
- Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
- Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.
- Business people and developers must work together daily throughout the project.
- Build projects around motivated individuals.
- Give them the environment and support they need, and trust them to get the job done.
- The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.
- Working software is the primary measure of progress.
- Agile processes promote sustainable development.
- The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
- Continuous attention to technical excellence and good design enhances agility.
- Simplicity – the art of maximizing the amount of work not done – is essential.
- The best architectures, requirements, and designs emerge from self-organizing teams.
- At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

The Agile Manifesto itself never set out to prescribe how any of this should be achieved, offering no actual practices that pin down how to demonstrate a preference for collaboration over negotiation, for instance. You can see how the philosophy might lead to preferring a 'user story' that can be discussed to a specification that should be adhered to, but the Manifesto left such practicalities to interpretation.

Others were prepared to define them further. Scrum, for example, had its genesis in an idea that a single cross-functional team should develop a product over several overlapping processes. This was developed by Jeff Sutherland and Ken Schwaber into a defined framework for iterative and incremental development. Today, Scrum is one of the most popular of the so-called Agile development methods. Schwaber himself, however, predicted that only 25% of organisations adopting Scrum would actually fully benefit from it.

If most of us can see the problems in the domain of software development, as it is currently managed, and if practitioners have established sensible principles and developed practices and tools whose success has been proven, what could still be wrong? For a long time, a debate raged where a convinced core of self-proclaimed 'Agilistas' insisted that if only all organisations became 'Agile' then the ills of software development would vanish.

Today, few people hold such an evangelical view. But given that a 2013 poll by Gallup suggested that over 70% of organisational change projects failed, it seems fair to ask what might be holding us back. Is there something wrong with the theories? Or is there something wrong with the way we implement them? Is there something wrong... with us?

The answer – predictably – is probably a mixture of all three.

Sometimes problems are so difficult that even the most brilliant theory cannot untangle them. Sometimes we cannot force our organisations to take the necessary steps to change. And finally, change is difficult because we don't respond to it in the open, rational way we like to think we do.

Activity 2: Change in your organisation

A common 'change' logic, sometimes known as the 'iceberg of change' is as follows:

Change policy to change actions,
Change actions to change behaviour,
Change behaviour to change habits,
Change habits to change attitudes.

Consider a change that your organisation attempted to implement recently. Ask yourself where it fits within this flow of change. Were changes made to policy or to actions? Have the changes reached as far as habit and attitude within the organisation? If not, consider where the changes petered out.

Commentary:

We tend to make changes to concrete aspects of our work – such as process or action – forgetting that the ability of these changes to last depends on attitudes and habits. Traditionally, we see making changes to these as outside of our direct control, and indeed impossible to influence. In fact, without being convinced at this emotional level, the rational logic behind a change will often fail to effect any difference.

2.3. We think we're rational, but we're not

Until very recently, much of economics depended upon the idea that people are essentially rational beings.

Let's take a popular thought experiment. I am given £10 to share with you. I decide on what the split will be, and you decide whether to accept the deal or not. If you accept it, we both get the money. If you say no, neither of us gets anything. If I offer you £5 and keep £5 for myself, you'll probably accept. If I offer you £1 and keep £9 for myself, you may not. Why? In theory, you still ought to accept the deal. After all you'll be £1 better off.

Figure 7. A £10 bank note

But people don't quite work like that. You might be annoyed, you might want to punish me for greedily grabbing so much more – in short, you may act in a way that pure rational economics doesn't predict – but which makes perfect sense to you.

How we make decisions depends upon an entire way of thinking that is not always completely rational. Many influences cause us to behave in ways that are non-rational. These range from prejudices that lead us to make incorrect judgements to a difficulty in assessing probabilities, so that we allow ourselves to be influenced more heavily by something else. For example, we might buy shares because we read about the company in yesterday's paper, or we might bet on black because the roulette ball landed on red the last five times in a row. We call these 'cognitive biases' and they grow out of a kind of judgement shortcut, officially known as a 'heuristic', but which we have chosen to call the slightly more conversational 'rule of thumb'. Collectively, these rules of thumb lead to what we might call 'intuition' or our 'gut feeling' about something.

Daniel Kahneman and his colleague Amos Tversky, worked extensively on understanding how people make decisions, judgements and errors. Their work led to the development of behavioural economics, which helps explain why people might work and vote against their rational and economic self-interest. Indeed, so powerful was the work that in 2002 it earned Kahneman a Nobel Prize in Economics (Tversky had died in 1996 and so did not share the prize).

In the course of his work, Kahneman described two methods of thinking that people use when making judgements: System 1 and System 2.

System 2 thinking is the kind of thinking that many of us pride ourselves on. It is rational and logical, it questions assumptions, digs into biases and searches out objective evidence in order to make a careful analysis and decision. System 2 thinking often feels hard – we are aware of it and it takes conscious effort to perform. It requires complex thought, sometimes computations, and we associate it with choice, control and agency. Despite this, System 2 is fed by the impressions and feelings that originate in System 1 – a fact of which we are often unaware.

Activity 3: Exposing System 1

Solve the following questions, designed to expose some of our internal 'rules of thumb':

1. A man and his son are in a car crash and they are taken to hospital in separate ambulances. The son is prepped for surgery when the lead surgeon enters and cries out: 'I can't operate on my own son!' How can this be?
2. Paul is a quiet, shy man with little interest in people or the real world. He likes to have structure and order around him, and all his actions show an attention to detail and neatness. Is Paul more likely to be a librarian or a farmer?
3. A psychologist wrote thumbnail descriptions of a sample of 500 participants consisting of 495 females and 5 males. The following description was chosen at random. "Sam is 23 years old and is finishing a degree in engineering. On Friday nights, Sam likes to go out cruising with friends while listening to loud music and drinking beer." Which one of the following two statements is most likely? a. Sam is a man b. Sam is a woman.

Answers:

1. Most lead surgeons are male – we know this as a rule of thumb and the assumption gets in the way of our realisation that this lead surgeon is female and therefore the child's mother.
2. Paul fits our social stereotype of a librarian. Nonetheless there are far more farmers in the world than librarians. Thus in terms of probability, it is more likely that Paul is a farmer.
3. The description fits a stereotype of masculinity, but the question tells us 495 of the sample are female descriptions. Thus it is more likely that Sam is female.

System 1 thinking operates automatically, quickly and with little awareness. Many of us would call it intuition – a 'supra-logic that cuts out all the routine processes of thought and leaps straight from the problem to the answer', as the poet and classicist Robert Graves put it. It is powerful stuff – presenting us with a seemingly complete and perfect solution. But sometimes the solution turns out to be wrong, because our unconscious assumptions and judgements have had an effect. Take a bias known as the 'halo effect': when a politician is confident, good-looking, tall and radiating health, we are more likely to listen to his ideas. That means we might reject a good idea and accept a bad idea, simply because of the speaker's attractiveness.

Let's be quite clear – this way of thinking evolved for important reasons. It's very fast and easy. It enables us to bypass the more cumbersome System 2 thinking. If you had to sit down and really think before you made any decision, you'd get very little done.

Activity 4: System 2 in action

6914 – 18 = ??

Once you have the answer, subtract 18 again. Repeat as quickly as possible.

In order to calculate the answer the first time you rely on System 2 thinking.

However, as you continue with the subtractions you soon spot a pattern. As you repeat the subtraction your brain establishes a mental model for how to do the calculation. In doing so and with the pattern established, the calculation can be handed off to System 1 thinking – it becomes fast and effortless again.

Kahneman and other writers provide some fascinating examples of the 'magical' use of expert intuition – firefighters running from a house just seconds before the floor collapsed, neo-natal nurses identifying a baby with a dangerous infection before blood results come back from the lab, chess masters who glance at a board and declare that white can win in three moves.

Rules of thumb typically stem from System 1 thinking, and we will have developed many of them for good reasons: employ intelligent people; listen to what your customer wants; don't trust the salesman who won't look you in the eye… The problem is that while System 1 thinking is eminently suited to some types of decision – issues within a creative industry are not among them.

Figure 8. Scene from 1991 film Backdraft (Universal Pictures)

3 WHY CREATIVE KNOWLEDGE WORK RARELY SUITS SYSTEM 1 THINKING

There are many areas in which intuitive thinking is extremely valuable: human beings are naturally superb at picking up on body language and vocal tones – you probably know within a fraction of a second if your partner is annoyed with you. That is why rules of thumb and intuition that are based on personal relationships are often very good. Yet there are other situations, where intuition is a terrible guide. In statistics, for example, even trained statisticians cannot rely on their intuition. In tests, a group of experts from the Society of Mathematical Psychology greatly exaggerated the likelihood that the original result of an experiment would be replicated.

Environments where intuition is very valuable share certain characteristics:

- They are familiar (developing good intuition takes time – over 10 years for a chess player).
- There is a great deal of fast feedback.
- The feedback provides a good indication of what will happen next.

In most realms of knowledge work as they are frequently managed and executed, the environment rarely has these characteristics. Often time is conspicuously absent; high variation in the type of work our teams do makes it harder to spot patterns, while few teams are kept together for long enough to develop shared experience. For example, in software, the length of time it often takes to implement any IT change means it is hard to get immediate feedback and the separation between design and use means actual feedback comes after the project is finished.

Finally, much of the work is intangible and because we find it hard to manage, we attempt to make it more tangible and predictable with reports or project plans that give us the illusion of control.

RAG reports, for example, are a favourite tool for tracking project performance – yet the traffic light symbols are misleading because it isn't predictive, like actual traffic lights. If a project step is amber, what is actually likely to happen next? We don't know – and yet we use the report as if it might tell us.

Figure 9. Example RAG Report

3.1. The ‘rules of thumb’ we use

Rules of thumb
Minimising cost is good
Focus on efficiency
Doing it once costs less – doing one big job all together will be more efficient than doing lots of little jobs
Delivering on time is always good – when you’ve agreed to a delivery date you must do everything possible to keep that promise
Detailed plans allow us to monitor progress and stay on track
When the goal is important enough there is a way of making it happen
People who say ‘something can’t be done’ aren’t thinking creatively
If the customer needs something, then it must be done
You shouldn’t release something until it’s right
You need to minimise risk
The best way to minimise risk is to create controls and processes
A standard process makes things easier and more efficient
We should identify and implement best practices

Probably as you read through the list above, your suspicious mind was working out all the times where the rules of thumb would prove unhelpful. But even if you know the ‘rules’ are flawed, in times of stress most of us revert to rule of thumb thinking.

And the reason we revert to them is that – to a certain extent – they work! We developed them in experiences where they were excellent guides to behaviour. That makes it really hard to throw them out, because they feel like common sense.

There are two main problems with rules based on ‘common sense’:

1. We don’t even consider choices that run counter to our rule of thumb.
2. Rules of thumb can have unintended consequences driving negative behaviours.

Imagine a manager who is planning a department's work. A really urgent project is being worked on. Her two members of staff can't get started until a piece of work is finished. She wonders whether she should bring forward another project, knowing that they will only be able to do a bit, before she needs them to switch back, or whether they should do a minor piece of work that is unimportant but that they could definitely finish off in a couple of days. She worries about value versus time and the cost of switching... What should she do?

Have you noticed that both options are based on a rule of thumb?

Everyone must be busy to be efficient.

What happens if the minor piece of work takes longer than expected, delaying their work on the project? What happens if in starting the 'big project', they make some assumptions that later cause delays? The manager has not even considered another possibility – letting the two staff do nothing at all. The very idea probably makes you feel uncomfortable. But that's so wasteful! Her boss might get angry! It would set a terrible example!

And yet actually, the risk of the two staff members not being able to work on the urgent project the minute it is possible, might well be higher than the waste of them sitting idle for two days. We just don't know, because we are unlikely to do the calculation because our rules of thumb blind us to the existence of the very idea.

Would your organisation consider a solution that ran so directly counter to a natural rule of thumb? Would you?

Activity 5: Are these your rules of thumbs too?

Take the list of rules of thumb to your team meeting and discuss.

How many of them do you agree with or believe to be true?

Rules of thumb	True/False?
Minimising cost is good	
Focus on efficiency	
Doing it once costs less – doing one big job all together will be more efficient than doing lots of little jobs	
Delivering on time is always good – when you've agreed to a delivery date you must do everything possible to keep that promise	
Detailed plans allow us to monitor progress and stay on track	
When the goal is important enough there is a way of making it happen	
People who say 'something can't be done' aren't thinking creatively	
If the customer needs something, then it must be done	
You shouldn't release something until it's right	
You need to minimise risk	
The best way to minimise risk is to create controls and processes	
A standard process makes things easier and more efficient	
We should identify and implement best practices	

Now take a recent decision which made an impact on your work and test the decision against each of the rules of thumb. How many does it agree with?

3.2. Where our rules of thumb originated

If rules of thumb didn't work at all, they wouldn't exist. We use them because we have experience of them working. But because the end product is often rather different from the environments in which they were developed, they often have unintended consequences – like a manager devoted to efficiency who actually causes delays, or a focus on driving down costs that impact on our ability to deliver value.

Many of our modern methods come from those which helped power the industrial revolution and mass production. It is hard to appreciate how brilliantly creative the ideas were at the time. Taylor's Scientific Management Theory is an example you may be familiar with. Before mass production, most complicated goods required craftsmen to make them, which was expensive and took time. A master hand weaver could weave two pieces of 24-yard (about 22 metres) long cloth per week, but a steam loom weaver could weave seven similar pieces during that same week. Two steam looms, moreover, could be worked by a single unskilled worker. The quality improved and became reliable and not dependent on the individual skill of the weaver. The cost of cloth fell dramatically and much more could be produced which created a global industry with major benefits.

The same concepts were applied and refined in numerous industries, from

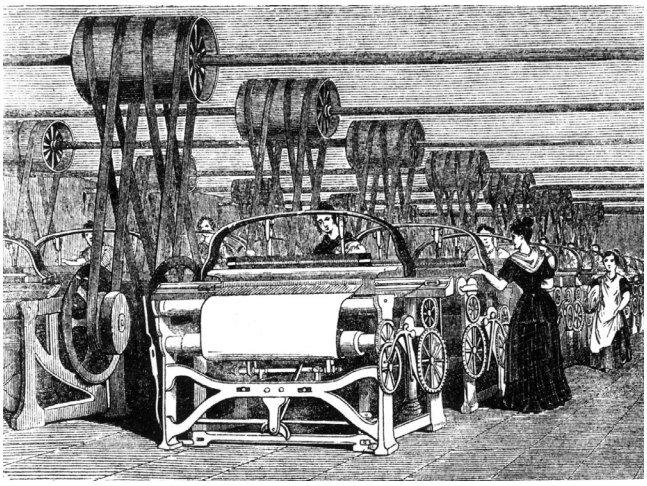

Figure 10. Steam powered looms weaving cloth

Cadbury's chocolate bars to Henry Ford's motor cars. It was the age of manufacturing: standardise the process; remove variability; drive down costs; increase efficiency and productivity. This was how to produce more, faster, cheaper and better.

No wonder we borrowed these ideas – not only do they work, but they feel highly applicable. Most companies aim to work at scale whilst being cost efficient and following a well-defined process.

The problem is that today's evolving market and work places are not the same as early 20th century manufacturing or other repetitive production industries. In fact, they are very different.

Manufacturing:	Knowledge work:
Output of tasks is **repetitive**	Output of tasks is **unique**
Output of tasks is **predictable**	Output of tasks is **unpredictable**
Requirements are **fixed**	Requirements **evolve**
Work is **bounded**	Work is **unbounded**
Inventory is **visible**	Inventory is **invisible**
Complicated	Complex

Of course – the process of manufacturing has evolved in the past 30 years since it has had to respond to constant change in market demands. Innovations have been employed such as the Japanese management principles of just-in-time production, which supports the challenges of a manufacturing environment. Even with our customer's increasing desires, the fact remains that production systems are essentially repetitive and have a scope with clear sets of parameters. Unfortunately, the process of bringing ideas to life and developing new products and services does not have the same level of repetition or bounding of scope. It is much more uncertain than that.

We're going to introduce a model which has proved very helpful in explaining the different ways of approaching work. We're using the Cynefin model, developed by David Snowden, although you may have come across very similar ideas in the 'Stacey matrix'.

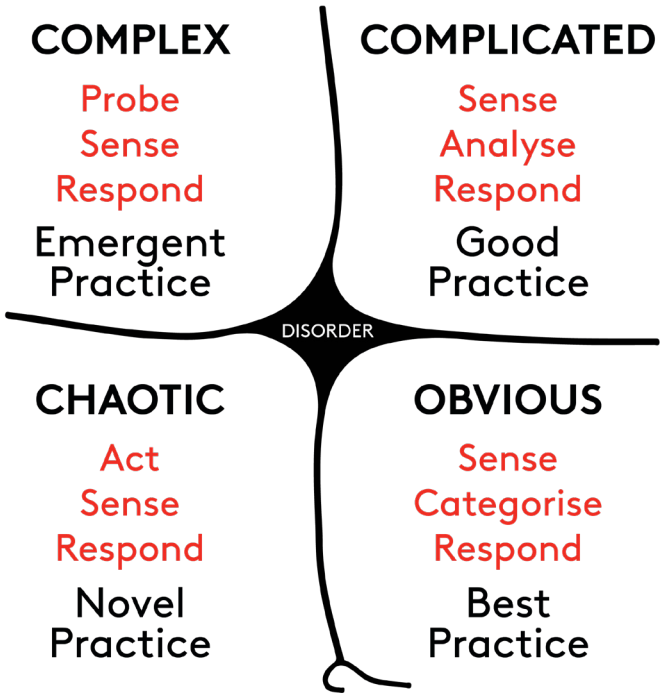

Figure 11. Cynefin model

3.3. Complicated or complex?

Obvious systems are fairly easy. Here, cause and effect are clearly linked. Directives are straightforward, decisions can be easily delegated, and functions are automated. Adhering to best practices or process reengineering makes sense. If you put your key into the car door and it doesn't open you are probably easily able to diagnose the trouble. Most likely you used your house key, but if not, something is wrong with the lock. The approach to this sort of system is 'sense, categorise, respond'.

Complicated systems can be very difficult to work out, but there is a link between cause and effect that can be uncovered if we search for it hard enough. This is the domain of the expert and there may well be several right answers, but you need to find the best. In this system the correct approach to diagnosis is 'sense, analyse, respond'. To use our car analogy – here the car engine might start, but make a strange noise. There are many components that could be at fault and so most people will take the car to an expert mechanic to diagnose the problem.

Complex systems may feel like complicated ones, but here the link between cause and effect is not only hard to discern, but one may affect the other. Think of traffic – the behaviour of the drivers impacts on how much traffic there is, which will in turn impact on the drivers' behaviour. In this case, there may be no 'right answer' identifiable in advance. Instead, complex situations call for what Snowden calls: 'probe, sense, respond' – the emergent nature of complex situations calls for an essentially experimental approach.

Chaotic systems shift constantly. It is impossible to predict a link between cause and effect because that relationship is constantly changing. Snowden suggests that you must 'act, sense, respond'. Here the only option is to act in order to establish some kind of order and then work out the next move. Crises tend to be 'chaotic' in nature, as do highly innovative or disruptive technologies. These are 'unknown unknowns', or 'black swan events'. Of course, these can be both good and bad.

The rules of thumb that work with complicated systems fall apart in creative fields, but because they are poorly suited as an environment for intuitive decision-making, we often don't recognise the negative consequences of our rules of thumb for quite a long time. Think of the development of a pharmaceutical product. It takes specialised skill and many instances of trial and error before it may reach the shelves. But once there, it is possible to duplicate these exact products again and again. If something goes wrong during production or even if a patient experiences an adverse reaction, it is difficult, but possible to find the cause and effect. This stage of production is in the domain of the expert; therefore it's a complicated system. On the other hand, creating a pharmaceutical product from scratch to serve a whole new set of criteria is a complex system. We are starting from a much lower level of knowledge and it will almost certainly take numerous attempts to find the solution.

Moreover, the ways in which industries operate today verges on the chaotic. And we don't mean that everyone's desks are a mess. Disruptive technology now threatens even the most traditional industries, while markets shift so quickly that the links between cause and effect break and reform dynamically. Thus, using 'probe, sense, respond' to act in complex systems is helpful to all industries today. Following this series of steps actually makes product development more appropriate to System 1 thinking. By experimenting, we gain fast feedback on what we're doing. Fast feedback provides greater predictability, and also helps us build our familiarity with the system so that we can develop and refine our intuition.

4 THE NEGATIVE CONSEQUENCES OF KEY RULES OF THUMB

This section is deliberately brief. We could go through the entire list of rules of thumb from Activity 5, but we won't – partly because we cover many of the existing rules of thumb that are wrong in the appropriate VFQ sessions. Instead, we'll look at the macro problem of the way we manage any project: the impact of attempting to fix three outcomes in advance.

We quoted the Standish Group's CHAOS Report's definition of a successful project – one which delivered on time, on budget and to a pre-set scope – and we said we would go on to critique this definition further. This definition of success illustrates what is often called the iron triangle or the 'triple constraint' of project management.

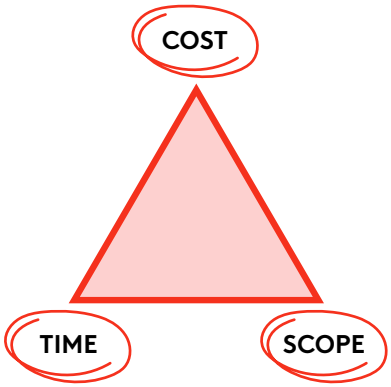

Figure 12. The project management 'iron triangle'

All design projects struggle with the same issue from architects to filmmakers. In every case where cost, time and scope are fixed, what is normally squeezed is the space in the middle of the triangle – quality. Of course, as our catalogue of disasters above made clear, 'constraints' often turn out to be not that securely fixed in any case. Numerous projects DO go over budget and over schedule, producing disappointing functionality of poor quality (of course, there are projects that will still deliver value despite time and cost overruns). And yet, rather than learning that the model is broken, organisation after organisation seems to believe that if they simply fix the deadline, budget and requirements in greater detail and more firmly, that this time it will be different. Time and time again, they are proved wrong.

Knowledge work is poorly suited to having these three elements fixed in advance. Fixing scope ignores the fact that in any truly innovative project, it is almost impossible to know in advance what will be useful or successful. And if scope cannot be fixed, then estimates of time and cost become equally uncertain.

It's very important that we stress that complaining about the impossibility of fixing constraints doesn't mean that we suggest ignoring them. Not knowing how much something will cost is not the same as suggesting money should be unlimited. Not knowing how long something will take in advance does not mean we can just keep going forever... The trick is to set the constraints in a different way – to break the iron triangle, and achieve better results along the way.

4.1. Breaking the triangle

Focusing on cost obscures value

Do you give to charity? If so, do you donate a set amount of money by direct debit from your bank, or do you prefer to pop money into a collecting tin shaken under your nose? There was an enormous furore a few years ago when it was discovered that people on the streets asking for donations were not volunteers, but actually paid by the number of gifts they signed up. These paid fundraisers gained far more donations than volunteers with collecting tins. Charities justified the higher costs because of the increased value they received. We understand the logic, and yet in many organisations, a short-term focus on cost blinds us to value.

Even worse, a focus on cost can actually make us more expensive. How often have you worked on a project with a 'contingency' fund? It's designed to take care of all the little unforeseen expenses that can crop up. Now think about how often that contingency was used up! We're willing to bet it was more often than not!

Of course, there are various points at which cash flow becomes a constraint, or at which our 'value' estimate is so speculative that we are unwilling to commit much cost to realise it. But in general the new guiding principle we need to substitute is:

DELIVER VALUE EARLY AND OFTEN

Focusing on time makes us slower

We are very used to deadlines and schedules – delivering 'on time' is a measure that most of us have used in our work. But what does 'on time' actually mean? Who created the deadline? What happens if we miss it? And if missing it has consequences, what do we do in order to hit the deadline?

If you have ever been asked to provide an estimate for anything, then you will recognise the answer. In order to guarantee a delivery date, we add a certain amount of contingency. In other words we 'pad' our estimates. And this padding tends to get used – not on unexpected emergencies, but on low value activities. This is partly because we often set up our processes so that there's little benefit in going faster than the estimate. Even if there is a very real commercial benefit of being early, we're often unable to take advantage of it.

We go through such questions in more depth in the Optimising Flow session. But the surprising truth is that our internal rule of thumb that we must deliver on time leads to a counter-productive reality: a focus on delivering on time actually makes us slower.

So the new guiding principle is:

OPTIMISE THE FLOW OF WORK END TO END

Focusing on scope increases waste and risk

Just as with the other two rules of thumb, this feels thoroughly counter-intuitive. Everything in normal life tells us that we ought to focus on scope as a way of avoiding waste and risk. If you were having a suit hand-tailored for you in Savile Row, you wouldn't tell the tailor 'do whatever you fancy'. You'd tell him what colour you liked, what material, what style you desire... Otherwise there's a risk the tailor might produce a huge baggy orange clown suit, which you would reject – a hugely wasteful proceeding. So it seems to make sense that in creative knowledge work you set up what you want the project to deliver and then measure how well the project performs against those requirements.

The problem is that the rule of thumb makes sense only as long as we know at the beginning what it is that we want. If we don't know, then the logic falls apart.

We tend not to know what we want, we find it hard to communicate what we might want, and as the project progresses we often change our minds. Because of this, we try to do lots of work up front to pin down exactly what we want. This work represents both time and money – and since things are still quite likely to change, it is often pure waste. Plus the more time and money you expend, then the risk of it being wrong increases: getting it wrong when you've spent £5 is not too worrying; getting it wrong after £50,000 is more serious.

So rather than pretending to know what we want in advance – scope; we need to focus on quality, which we can define as 'the right thing'. We can't know what the right thing is in advance, we find out as we work, through feedback. Thus, we break the final constraint with a new guiding principle:

DISCOVER QUALITY WITH FAST FEEDBACK

4.2. The three new guiding principles

The three we've explored above are:

- Deliver **value** early and often
- Optimise the **flow** of work end to end
- Discover **quality** with fast feedback

These guiding principles are designed to result in the outcomes of increased Value, improved Flow and enhanced Quality.

That's the rationale, quite simply, behind the name of this education programme: Value, Flow, Quality. Or because we're an industry that loves acronyms: VFQ.

5 USING VFQ TO CHANGE

Let us imagine that having read this session, and a few other books as well, it becomes clear to you that your organisation needs to change.

On Monday morning you gather everyone together. 'We're managing our projects badly!' you announce. 'I have lots of ideas about how to do things better!'

What happens?

1. The crowd erupts into prolonged cheers and applause.
2. A stunned silence while the executives weep gratefully into their coffee-mugs.
3. Everyone makes a face that suggests you should have taken a longer shower this morning, and politely pretends not to have heard.

Let us tell you a story.

Galileo believed that the earth revolved around the sun, and he attempted to explain this in a book snappily entitled Dialogue between the Two Chief World Systems. To the Pope and the Inquisition, this suggestion was a violation of accepted ideas and religious beliefs at the time; and so they ordered that Galileo retract his statement that the earth moved—or else be burned at the stake. Galileo gave way, although he supposedly muttered 'E pur si muove' (and yet it moves) afterwards.

Your team probably won't haul you up before the Inquisition, threaten you with burning, etc... but don't expect too much gratitude.

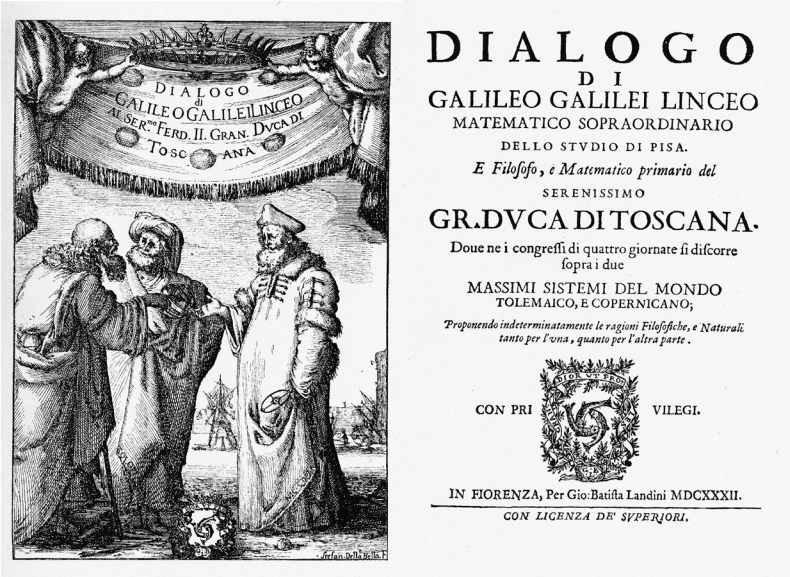

Figure 13. Galileo's Dialogue Concerning the Two Chief World Systems

Belief is tough to shake, not least because an interconnected system of great complexity has been built up on just those 'rules of thumb', which you are trying to replace with thoroughly counter-intuitive arguments. Reinertsen put it very neatly: 'Today's orthodoxy has institutionalised a set of internally consistent but dysfunctional beliefs. This has created a tightly interlocking and self-reinforcing system, a system from which it is very difficult to break free.'

Flow is all about interconnectivity. Your organisation functions as it is. If you change just one part of it, it is likely to function less well. Your change will be instantly undone, branded a failure, and the status quo resumed. There may be many different entrenched systems working against your change. Bonuses, metrics or other types of motivation may promote individual rather than team goals, or departmental rather than organisational success. Other processes may have built strong dependencies on things being done a certain way – changing your own part of the process might cause serious upheaval in how they want to work.

Often what we long for is the complete replacement of an entire product. When Toyota developed lean manufacturing in post war Japan, they didn't run a standard production line but scaled down in order to avoid 'over-production'. Instead they embraced an entirely different concept – one of 'pull' and 'just in time' production which carried zero inventory. It was a very daring and drastic idea; one that might never have been accepted were it not so obvious that Toyota faced a stark choice between certain failure and uncertain survival. You don't want your organisation to be facing such a stark choice. Instead you want them to change before change is forced upon them.

This is not an easy nut to crack.

You can do a huge top-down mandatory change. If you are the CEO and we've convinced you – great. Off you go.

If you're not the CEO, you're going to have to do things rather differently.

You'll need to persuade others, not just your immediate team, but a broad range of people across the business. You will have to make small changes, learn from failures and publicise successes.

In fact, you need to start working through the VFQ session books. We wrote them in a particular way because we know change is hard. We know that theory is not the only thing and that slavishly following a process can backfire. You need to test out what we're saying. You need to prove that the ideas really work. You need to be able to collaborate and demonstrate success.

The good news is that companies do improve; culture does shift. Change is hard, but people do it.

5.1. Reasons for change

We've been through the issues with projects and the way we manage work and we've balanced them with rationales for a new approach. Unfortunately this does not do away with the fact that change is hard. Every management book you read will ask you to consider your own reasons to change. What immediately pops into your head when faced with this question? Do you consider your team first – maybe a shared goal or mission, or something just as grand? If so, then you are forgetting a major factor – it is also about what matters to you. The real question of 'Why Change?' must align the reasons for change as an organisation and the motives of an individual.

Humans are becoming increasingly overloaded with information, initiatives and new ideas. The demand for our attention has exceeded our capacity to fulfil these asks. In his book The Power of Full Engagement, Jim Loehr tells us that we need to make expedient choices in order to survive and maintain our sanity. Furthermore, we need to consider what energy is really available to drive change – after all, as the saying goes, 'one volunteer is worth ten pressed men'.

We will look at the intrinsic motivators for individuals in more detail during the Motivation session, but the main point is that reasons vary between personalities and circumstances. Change is what some people live for; they might enjoy challenging the market with new technology, or happily battle the status quo every day. The marketplace and external world excites and drives them. But for others, their reason for change is to simply be home on time to read their children a bedtime story. Whatever it is, it must also align to the wider environment of work.

5.2. Consider the marketplace

Looking at the world around us, we find a fast-paced dynamic marketplace dominated by change. As described previously this is a complex environment – verging on the chaotic. Much of this is driven by the Internet and the Digital Revolution. We must understand what is happening to our customers, competitors and within our own organisation before we can determine rational reasons for change.

Most of us look back now and chuckle, but if you were in fact the proud owner of one of Motorola's 'brick-style' mobile phones – almost requiring two hands to use and a briefcase to carry it in – then you were also among the first to trial one of the greatest 'disruptive innovations' in history.

Figure 14. Martin Cooper of Motorola with a modern phone and the one he used to make the first publicised handheld mobile phone call in 1973

The term 'disruptive innovation', first coined by Clayton Christensen, refers to a process that causes the existing marketplace to change. Often it's in the form of a simple product or service that starts at the bottom serving some low profit sector or market, and then relentlessly moves up until it competes with, or even replaces the established market leaders. Just as discount retailers disrupted the market for full-service department stores, Motorola did so with a new product – a product that appeared unexpectedly and improved the existing market.

Christensen also presented the term 'job-to-be-done'. He analysed how disruption occurred by exploring the way that one product or service achieves almost the same outcome or 'job-to-be-done' as another. Christensen's theory enforces that we are all susceptible to disruption – people are always creating new ways to achieve the same outcomes, and competing on a different level to previous paradigms. If we actively investigate the market around us then we should never have to face the fate of the landline telephone business. But if we do, then at least we'll have a fighting chance of contesting in the new world.

Models such as Porter's Five Forces Analysis and the PEST analysis enable us to examine our own macro-environments. Collecting knowledge of the markets attached to our domains means we can build a better understanding of the dynamics. We can't expect to reach our goals as an organisation if we do not have a clear idea of why we are chasing it.

The travelling circus is probably not an industry you think about too often, but it is competitive like any other. When seals balancing beach balls on their noses and contortionists folding neatly in to a goldfish bowl became standard practice, we thought we'd seen it all. Then Cirque du Soleil came along. They were crowned world's best theatrical show as soon as audiences witnessed their blend of circus, opera and ballet. The creators of Cirque du Soleil had discovered a 'blue ocean'. The authors of **The Blue Ocean Strategy,** W. Chan Kim and Renée Mauborgne, refer to red and blue oceans as different types of marketplaces. Red being the industries that are in existence today where the rules of competition are known, and there aren't many distinctions between the players, and blue are those that are not yet in existence. The first to discover will own the space. It is a guide on how to identify potential gaps in the market through strategies, frameworks and tools.

It doesn't matter which model you use. Just remember that with every one, you must examine the competition and understand how customer perceptions are changing and what might be their driving force. Remember to consider the competitors who exist today and also the ones you haven't yet discovered. The ones you need to watch out for are those that can deliver the same outcome or complete the same 'job-to-be-done' as you, but in an entirely different way. These are the disruptors who have the potential to radically change your market. You need to examine these in the context of what your organisation excels at and possibly what needs to be improved on. In order to compete in a marketplace where you have no competitors, you need to study the social, technological, environmental, political and competitive trends to help better understand what you need to focus on to achieve future success.

Activity 5: Why should you want to change?

You can do this activity by yourself or you can discuss it in a group. We are going to take you through some steps to think about your own company. First, consider the example below.

Public libraries have existed for centuries as a place for people to search for information. This is their 'job-to-be-done' – making information available to access or borrow. The Internet (which introduced Amazon and many others) came along and created the ability to do this in radically different ways, eliminating the need for people to leave their homes. This progressed to entire books becoming available digitally, meaning that students would no longer need to carry a heavy stack to university each day, nor would they have to spend the extra time going back and forth – returning them within a time limit. Extracting information from the Internet was easier. It simply required copy and paste. It has been acknowledged that libraries need to improve the services offered if they want to compete with the Internet. Libraries have already attempted to leverage their services by providing more computers with Internet access and it has been suggested that staff be trained so they are more IT literate. To be successful, these services must be financially supported which is problematic if libraries are publicly funded. However, their survival could rely on this.

1. For your own organisation consider what is your 'job-to-be-done'? There may be more than one, so list them out and discuss them with your colleagues. It isn't always easy or as straightforward as you think.
2. Now look at the competitive landscape of your industry – who are the direct competitors? Who supplies services to you and which companies do you provide services to? Could they move into your space? What other substitutes exist to deliver the same outcome of your company's 'job-to-be-done'? Who are the new entrants or the disruptors?
3. Look at the external influences happening in the world that might create an opportunity for disruption. Examine the political, environmental, social and technological changes that you might see and discuss how these might affect your organisation. This is known as a PEST analysis.
4. Finally, consider what your organisation is good at. What could you do better? What needs to change to be ready to capitalise on the changes you see and the ever-changing market landscape.

How do you see these things impacting you? Are there aspects here that excite you?

CASE STUDY: IBM Software Group

IBM is one of the world's biggest companies. It employs over 430,000 staff at locations all around the world and works on products and services, including software, hardware and systems.

After steering to near disaster in the early 1990s, IBM had recovered commercially, not least through heavy investment in software. IBM Software Group had a total of 25,100 developers spread over 19 countries. They mostly used a combination of Waterfall and iterative development processes.

Various teams had set themselves challenges, including reduction of cycle time, improved customer satisfaction, reduction of defect resolution time, and improved predictability. In order to achieve these goals, they knew they needed to improve their ability to collaborate. They had some real challenges including very large projects with correspondingly big teams. These teams were often geographically dispersed or crossed organisational barriers and had different existing approaches to building software.

In 2007, several teams began using Agile and Lean development methods, selecting key projects that would act as 'proof points'. These projects would be developed using short, time-boxed iterations with stakeholder feedback.

In setting up the experiment, the organisation ensured that the team had: strong support from senior management; an experienced leader; necessary education, tools and governance; an expectation of learning and change. The experiment was not set up to succeed or fail but to test and adapt.

Here's an example of one specific team (Sametime 7.5) and their major steps:

1. frequent, short code iterations with regular demonstrations
2. self-organised around feature teams to increase code sharing and review
3. lightweight specs and outlines
4. combined teams across the organisation
5. invited contribution and participation from internal people on early versions
6. tested beta version with external customers
7. continuous prototyping
8. frequent or automated code reviews
9. focus on the necessary, eliminate any 'nice-to-haves'.

Those who went through the transformation acknowledged how difficult it was – partly because of the challenges already discussed, but partly because of a more emotional response to change, what they called 'the trough of disillusionment'.

IBM Rational made an insightful comment: "we often wished we could achieve our goals by simply adopting new processes or tool sets... [but] there is no one-size-fits-all, out-of-the-box suite of tools that can move any team or project from entrenched systems and processes into an agile, measured environment".

6 CONCLUSION

The start of any change is self-awareness. Dan Ariely, author of Predictably Irrational suggests, 'Armed with the knowledge that human beings are motivated by cognitive biases of which they are largely unaware, businesses can start to better defend against foolishness and waste.'

Every VFQ session examines the rules of thumb frequently used, the problems that result and examines the rationale behind changes. This means that everyone should appreciate from first principles why change is needed. This in-depth understanding is important. Although the sessions go on to detail practical changes – tools, practices, processes and methods – often it's not possible to tell you exactly what you need. After all, we don't know the exact circumstances of your organisation. That's why VFQ sessions focus on the ability to think critically about the problems and potential solutions to decide on the specific approach that will work for you.

This isn't enough. You need to practice using new tools – often in a way that won't risk upsetting existing processes. You also need to demonstrate your reasoning and ideas so that you bring colleagues along with you.

Our session booklets embody the idea of 'probe, sense, respond' in the way they are written. Just as important as the concepts or the case studies, is the series of activities set throughout the booklets. These range from fun demonstrations of principles to planning and implementation sessions in which you work with your team to test out ideas and quickly refine them based on real results.

This is called work-based learning. Modern educational theory stresses that the best way to really absorb knowledge is through doing. You've probably experienced for yourself how true this is. If you need to put up a shelf, then you could read an instruction manual. Even better, you could watch an instruction video or have someone demonstrate it to you. But only by doing it yourself several times will you really become an expert DIY shelf-builder.

Actually – this is hardly new. Xunzi, the Confucian scholar, wrote:

If I Hear, I Forget;
If I See, I Remember;
If I Do, I Understand.

Your experience and learning go far beyond the VFQ education programme. You know that you work in a complex environment – so the most important piece of learning is the way you deal with that: probe, sense, respond. We can't know your problems or second-guess what you will learn in tackling them.

It's possible that you'll find yourself disagreeing with things we have written. That's fine. We've analysed the issues we see in product development as practitioners ourselves. We've provided a thorough grounding in the best theory available. Finally, we've recommended tools that we've seen work, with case studies demonstrating where they have succeeded and failed. We cannot promise that the tools will always work, or that the answers are always applicable to your situation. Instead, this course aims to develop your personal expertise through experience based on sound foundations of critical thinking.

We wish you the very best of luck on that journey and we welcome your feedback, comments and stories of how things go.

Learning outcomes

Now that you have completed this session, you should be able to:

Recognise the scale of issues in how we deliver products and services

- A perception of business as slow and expensive
- The number, cost and impact of project failures and the increasing reliance of organisations on technology

Identify flaws in focusing on an iron triangle of cost, time and scope

- Despite stringent controls on cost, time and scope – product and service development remains slower and more expensive than we want
- Few organisations have a clear idea on the value they receive in return for expenditure
- Few quantify the cost of poor quality or technical risk

Have a brief overview of the history and philosophy behind 'Agile' development

- Agile confines itself to principles rather than spelling out practices or tools
- A plethora of methods are linked to Agile, including Scrum, Kanban and XP
- Although many organisations have tried Agile, a significant number have struggled with implementation
- Three main problems block success: difficulty in knowing how to adapt Agile to unique situations; organisational resistance to change, and our individual reliance on unexamined rules of thumb

Understand how people's intuitive ways of thinking create rules of thumb

- People are not rational, we often act against our self interest
- Use of System 1 and System 2 thinking in the way we make decisions
- Much of our rational System 2 thinking is based on unacknowledged System 1 rules of thumb

Appreciate the negative impact of rules of thumb in the way we deliver today

- Product development as most commonly managed does not provide opportunities for familiarity, fast feedback or predictability of outcome
- Creative knowledge work is complex while many rules of thumb originated in 'complicated' manufacturing systems
- Our rules of thumb often have counter-intuitive consequences which actually drive the negative results we want to avoid
- Focusing on cost often makes us more expensive
- Focusing on time often makes us slower
- Focusing on scope increases waste and risk

Discover and use three new guiding principles to break the iron triangle

- Deliver **value** early and often
- Optimise the **flow** of work end to end
- Discover **quality** with fast feedback

Use the VFQ course to inspire and implement changes in your organisation

- Change rarely happens as a top-down directive
- Pointing out problems can often be difficult, leading to a 'shoot the messenger' approach or jumping to a new solution, any solution, rather than thinking through what is required
- Practical activities structured around your day-to-day work mean you can introduce practices safely and prove their success by consensus
- Follow the suggestion of 'probe-sense-respond' and apply critical thinking to your unique situation

BIBLIOGRAPHY

Agile Manifesto, 2001. Principles behind the Agile Manifesto. [online] Available at: <http://agilemanifesto.org/principles.html>. [Accessed 17 October 2011].

Andreessen, M., 2011. Why Software Is Eating The World. [online] Available at: <http://online.wsj.com/article/SB10001424053111903480904576512250915629460.html>. [Accessed 8 March 2013].

Beck, K., 2004. Extreme Programming Explained: Embrace Change. 2nd Edition. Addison Wesley.

Bordeaux, A., 2007. 10 Famous Product Failures And The Advertisements That Did Not Sell Them. [online] Available at: <http://www.growthink.com/content/10-famous-product-failures-and-advertisements-did-not-sell-them>. [Accessed 8 January 2015].

Calleam Consulting Ltd., 2013. J.C. Penney. [online] Available at: <http://calleam.com/WTPF/?p=5874>. [Accessed 20 January 2015].

Chan Kim, W., Mauborgne, R., 2005. Blue Ocean Strategy: How To Create Uncontested Market Space And Make The Competition Irrelevant. Harvard Business School Press.

Chayka, K., 2014. Time Is Money, But That Doesn't Mean You Need To Work Non-Stop. [online] Available at: <http://www.psmag.com/business-economics/time-money-doesnt-mean-need-work-non-stop-81438>. [Accessed 14 January 2015].

Christensen, C.M., Raynor, M., 2013. Innovator's Solution, Revised and Expanded: Creating and Sustaining Successful Growth. Harvard Business Review Press.

designbuild-network., 2014. Wembley Stadium, London, United Kingdom. [online] Available at: <http://www.designbuild-network.com/projects/wembley/>. [Accessed 16 January 2015].

Drucker, P.E., 1996. Landmarks Of Tomorrow: A Report On The New Post Modern World. Transaction Publishers.

Gawande, A., 2011. The Checklist Manifesto: How To Get Things Right. Profile Books.

Gawande, A., Bell, K., 2010. Using Checklists To Prevent Failure. [online] <https://hbr.org/2010/01/using-checklists-to-prevent-fa>. [Accessed 7 January 2015].

George, M., Wilson, S., 2004. Conquering Complexity In Your Business: How Wal-Mart, Toyota and Other Top Companies Are Breaking Through The Ceiling On Profits And Growth. McGraw-Hill Professional.

Gray, P., 2011. The Department Of No. [online] Available at: <http://www.techrepublic.com/blog/tech-manager/the-department-of-no/7110>. [Accessed 26 February 2013].

Hamer, T., Hamer, M., 2015. The Edsel - A Legacy Of Failure. [online] Available at: <http://classiccars.about.com/od/classiccarsaz/a/Edsel.htm>. [Accessed 16 January 2015].

Harford, T., 2012. Adapt: Why Success Always Starts With Failure. Abacus.

Harry Ransom Center, 2015. The Gutenberg Bible. [online] Available at: <http://www.hrc.utexas.edu/exhibitions/permanent/gutenbergbible/>. [Accessed 8 January 2015].

Harvard Business Review, 2009. The End Of Rational Economics. [online] Available at: <http://hbr.org/2009/07/the-end-of-rational-economics/ar/1>. [Accessed 25 November 2011].

Harvard Business Review, 2013. Three Rules For Making A Company Truly Great. [online] Available at: <http://hbr.org/2013/04/three-rules-for-making-a-company-truly-great/ar/1>. [Accessed 25 March 2013].

Inman, R. A., 2015. Lean Manufacturing And Just-In-Time Production. [online] Available at: <http://www.referenceforbusiness.com/management/Int-Loc/Lean-Manufacturing-and-Just-in-Time-Production.html>. [Accessed 7 January 2015].

Johnson, S., 2011. Where Good Ideas Come From: The Seven Patterns Of Innovation. Penguin.

Jones, P., 2012. E-Book Production Overtakes Hardbacks In 2011. [online] Available at: <http://www.thebookseller.com/news/e-book-production-overtakes-hardbacks-2011>. [Accessed 14 January 2015].

Joss, C., 2007. The Power Of Intuition. [online] Available at: <http://www.stephenmartile.com/The-Power-of-Intuition.pdf>. [Accessed 25 November 2011].

Kahneman, D., 2011. Thinking, Fast And Slow. Allen Lane.

Langer, A., 2010. The IT Dilemma. [online] Available at: <http://www.ittoday.info/Articles/IT_Dilemma.htm>. [Accessed 8 March 2013].

Langley, M, A., 2013. PMI's Pulse Of The Profession, The High Cost Of Low Performance. [online] Available at: <http://www.pmi.org/learning/pulse.aspx>. [Accessed 12 January 2015].

Lee, D., 2010. Dr Atul Gawande's Checklist For Saving Lives. [online] Available at: <http://news.bbc.co.uk/1/hi/health/8493922.stm>. [Accessed 6 January 2015].

Loehr, J., 2005. The Power Of Full Engagement: Managing Energy, Not Time, Is The Key To High Performance And Personal Renewal. Free Press.

Lundquist, E., 2012. Why Business Doesn't Look To IT For Innovation. [online] Available at: <http://www.informationweek.co.uk/global-cio/interviews/why-business-doesnt-look-to-it-for-innov/240008408>. [Accessed 2 March 2013].

Maidique, M., 2011. Decoding Intuition For More Effective Decision-Making. [blog] 15 August, Available at: <http://blogs.hbr.org/cs/2011/08/decoding_intuition_for_more_ef.html>. [Accessed 25 November 2011].

May, M., 2008. The Elegant Solution: Toyota's Formula For Mastering Innovation. Simon & Schuster Ltd.

McAfee, A., 2010. The Future Of Decision Making: Less Intuition, More Evidence. [blog] 7 January, Available at: <http://blogs.hbr.org/hbr/mcafee/2010/01/the-future-of-decision-making.html>. [Accessed 25 November 2011].

Meiritz, L., 2012. Gartner Survey Shows Why Projects Fail. [online] Available at: <http://thisiswhatgoodlookslike.com/2012/06/10/gartner-survey-shows-why-projects-fail/>. [Accessed 14 January 2015].

Motorola, 2015. About Motorola. [online] <http://www.motorola.com/us/consumers/about-motorola-us/About_Motorola-History-Timeline/About_Motorola-History-Timeline.html>. [Accessed 16 January].

Porter, M.E., 1998. Competitive Strategy: Techniques For Analysing Industries And Competitors. Free Press.

Reinertsen, D., 2009, The Principles Of Product Development Flow. Celeritas Publishing.

Ries, E., 2011. The Lean Startup: How Constant Innovation Creates Radically Successful Businesses. Portfolio Penguin.

Schwaber, K., 2010. Message From Ken. [blog]. Available at: <http://www.controlchaos.com/message-from-ken/>. [Accessed 25 November 2011].

Schwaber, K., Sutherland, J., 2012. Software In 30 Days. John Wiley & Sons.

Shalloway, A., Beaver, G., Trott, J., 2009. Lean-Agile Software Development: Achieving Enterprise Agility. Addison-Wesley.

Smith, P., Reinertsen, D., 1997. Developing Products In Half The Time. 2nd Edition. John Wiley & Sons.

Srinivasan, A., Kurey, B., 2014. Creating A Culture Of Quality. [online] Available at: <https://hbr.org/2014/04/creating-a-culture-of-quality>. [Accessed 15 January 2015].

Strategic PPM., 2010. Strategic PPM, Project And Portfolio Management. [online] Available at: <https://strategicppm.wordpress.com/2010/11/16/project-failure-channel-tunnel/>. [Accessed 19 January 2015].

The Coca-Cola Company, 2012. The Real Story Of New Coke. [online] Available at: <http://www.coca-colacompany.com/history/the-real-story-of-new-coke>. [Accessed 9 January 2015].

The Lean Startup, 2015. The Lean Startup, Case Studies. [online] Available at: <http://theleanstartup.com/casestudies>. [Accessed 12 January 2015].

The Nielson Company, 2014. Global Online Purchase Intentions Have Doubled Since 2011 for E-Books. [onlne] Available at: <http://www.nielsen.com/uk/en/press-room/2014/global-online-purchase-intentions-have-doubled-since-2011-for-ebooks-toys-sporting-goods.html>. [Accessed 14 January 2015].

The Standish Group, 1995. The Chaos Report. [online] Available <http://www.projectsmart.co.uk/docs/chaos-report.pdf>. [Accessed 28 March 2012].

The Standish Group, 2013. Chaos Manifesto 2013, Think Big, Act Small. [online] Available at: <http://www.versionone.com/assets/img/files/CHAOSManifesto2013.pdf>. [Accessed 6 January 2015].

Trout, J., 2006. Peter Drucker On Marketing. [online] Available at: <http://www.forbes.com/2006/06/30/jack-trout-on-marketing-cx_jt_0703drucker.html>.[Accessed 13 January 2015].

Vinjamuri, D., 2013. The Trouble With Finding Books Online - And A Few Solutions. Available at: <http://www.forbes.com/sites/davidvinjamuri/2013/02/27/the-trouble-with-finding-books-online-and-a-few-solutions/>. [Accessed 25 March 2013].

Watts, D., Hasker, S., 2006. Marketing In An Unpredictable World. [online] Available at: <https://hbr.org/2006/09/marketing-in-an-unpredictable-world/ar/1>. [Accessed 15 January 2015].

Web Exhibits, 2015. Antiquity. [online] Available at: <http://www.webexhibits.org/pigments/intro/antiquity.html>. [Accessed 12 January 2015].

Wikipedia, 2011. Behavioural Economics. [online] Available at: <http://en.wikipedia.org/wiki/Behavioral_economics>. [Accessed 25 November 2011].

Wikipedia, 2015. Blue Ocean Strategy. [online] Available at: <http://en.wikipedia.org/wiki/Blue_Ocean_Strategy>. [Accessed 12 January 2015].

Wikipedia, 2013. Cynefin. [online] Available at: <http://en.wikipedia.org/wiki/Cynefin>. [Accessed 26 March 2013].

Wikipedia, 2015. Disruptive Innovation. [online] Available at: <http://en.wikipedia.org/wiki/Disruptive_innovation>. [Accessed 9 January 2015].

Wikipedia, 2015. Knowledge Worker. [online] Available at: <http://en.wikipedia.org/wiki/Knowledge_worker>. [Accessed 9 January 2015].

Wikipedia, 2015. Porter Five Forces Analysis. [online] Available at: <http://en.wikipedia.org/wiki/Porter_five_forces_analysis>. [Accessed 13 January 2015].

Wikipedia, 2015. Spider-Man: Turn Off The Dark. [online] Available at: <http://en.wikipedia.org/wiki/Spider-Man:_Turn_Off_the_Dark>. [Accessed 9 January 2015].

Winston, C., 2013. Government Implementation Of Large-Scale Projects: Government Failure, Its Sources, And Implications For The ACA Website Launch. [online] Available at: <http://www.brookings.edu/research/testimony/2013/12/04-government-implementation-large-scale-projects-winston>. [Accessed 15 January 2015].

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