

# Technology Monetarism combats Technology Inflation

By Huw Webber, with contributions from Darren Chiappinelli, Sarah Elizabeth Hager, Greg Scala, and Amy Sears

## Unmanaged Technology Inflation: the enemy of profits

*Companies are complex entities when scaled. At the same time, CxOs bemoan complexity while often increasing it through their actions. How does this happen? And what is the effect on profits?*

Mathematics explains why simpler systems are better than more complex ones. The fewer elements in a system, the easier a system is to predict and control. The more elements in a system, the more unpredictable and costly such a system becomes. It takes much more effort to try to control and maintain a complex systems environment, so the economic benefits of a large scale system are harder to realize without some idea of how you will manage that system.

What usually happens in a company is this: when you are small, your business is in a relatively simple state. It requires few systems and the volumes of transactions are manageable. These systems are managed by people who have technical expertise and not necessarily much business acumen. These systems may even be manual. Data, processes and employee or customer experience are easy to define and control.

As a company grows, it accrues systems because there's no obvious penalty for adding a system or increasing complexity for some marginal business utility. Systems become core to the customer facing workflow. Business leaders get what they demand to manage millions of transactions, customers and associated increased revenues: they obtain customized solutions and/or dedicated packages to manage business-critical functions like Finance, Inventory, CRM, ERP, billing and workflow. This happens while your existing technical staff is stuck in a start-up mindset: old systems are almost never retired, upgraded or properly integrated<sup>1</sup>. The technical environment becomes more complex, and ad hoc integration becomes common.

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<sup>1</sup> This equates to a "bailing wire and duck tape" mentality.

Worse, complexity increases over time<sup>2</sup> - especially if multiple company divisions all purchase technology resources or if one or many acquisitions occur (the latter scenario brings its own sets of integration problems). Collaboration amongst groups becomes problematic due to differing motivations and orthogonal, irreconcilable technical preferences. Communication and orchestration become major problems, and so does the overhead required to get anything done. Often, the result of a random business event leads, literally, to chaos. For example:

1. Operational failure. A telecom company launches a new product that requires internal system configuration. This product is launched on "Black Friday." Unfortunately, due to technical error with the configuration, the sales system for collecting order fails during launch. The result is that the company misses its sales target.<sup>3</sup>
2. Brand failure. 160M credit card records were recently stolen from companies which included 7-Eleven, Dow Jones, Nasdaq, JetBlue and JC Penney.<sup>4</sup> The security breach was caused by use of "SQL Injection" techniques. Modern technical systems are usually hardened from such attacks. Unmanaged complexity means that there are un-patched or un-fixed vulnerabilities in your systems environment.
3. Failure to launch, with adequate quality (or in a timely manner). British bank RBS "caused outrage among the millions of customers affected... [when]... customers were unable to access their funds for up to 24 hours" due to a system change. This was a result of the "complexity and cost of software system upkeep" increasing while "actual spend in areas such as [regression] testing has tended to lag behind." The estimated cost to the bank is in excess of 175M GBP (~US\$267.5M)<sup>5</sup>.

Consider an analogy: *Monetary Inflation*. This occurs when money is devalued - i.e., the cash currency of ordinary people and corporations become worthless, and business is difficult to transact because of the constantly (upward) changing cost of goods and services. This is usually caused by excessive money supply when a central bank prints currency beyond a critical point at which public confidence in the money collapses (also called "hyper-inflation").

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<sup>2</sup> Time itself can be defined as our perception of the linear progression of ordered events (the big bang) to disordered ones (current state). There simply are more disordered states than ordered ones.

<sup>3</sup> See [http://www.leapwireless.com/ar2011/downloads/2011\\_Annual\\_Report-2\\_02.pdf](http://www.leapwireless.com/ar2011/downloads/2011_Annual_Report-2_02.pdf) p 33. "From time to time since the launch of our customer billing system in the second quarter of 2011, we have experienced intermittent disruptions with certain aspects of the system, which have limited our ability to activate new customers and to provide account services to current customers. We believe that these system issues have had the effect of reducing our gross customer additions and increasing churn, and these system issues could impact customer additions and churn in the first half of 2012. Although we believe that we have largely identified the cause of these disruptions and are implementing plans to remedy them, we cannot assure you that we will not experience additional disruptions with our customer billing system in the future."

<sup>4</sup> See <http://www.nbcnews.com/technology/160-million-credit-cards-later-cutting-edge-hacking-ring-cracked-8C10751970>.

<sup>5</sup> See <http://dofonline.co.uk/index.php/strategic-finance/167-strategic-finance-2010/11569-it-sytem-meltdown-45435>.

Similarly, when the supply of technology is unmanaged over time, the complexity of a technology infrastructure within a company becomes unmanageable and/or economically unsustainable. The company's economic value is *deflated* because its costs are unsustainable and/or the brand has diminished and/or the company becomes so inflexible that it cannot respond to structural or external market changes. These effects should be appropriately called *Technology Inflation*. The effects of Technology Inflation are gradual, and are usually noticed *after* crisis has struck, E.g.,:

1. Rising cost relative to competition and diseconomies of scale - the possibility that your technology environment becomes more expensive per unit or transaction or per implemented change, as total costs increase due to the increased complexity of your environment.
2. Data fragmentation - too many data silos means management reporting in real time is difficult, unreliable and/or incredibly manual.
3. Process fragmentation - processes are not seamless or efficient, inflexible and/or complex. There also may be too much "manual processing," rework or inadequate exception handling.
4. Channel orientation - your customer experience is degraded. The customer feels the lack of cohesion as they are passed from one channel to another.
5. Inertia - an inability to launch new products on time, with the appropriate features or quality.
6. Unreliability - an increase in the amount of unplanned downtime (or performance degradation) at critical times (e.g., Black Friday, Cyber Monday or at other peak times).
7. Brand damage - your dusty, overly-complicated technology stack has become transparent to the customer. Your brand becomes unappealing because the customer has figured out that one channel cannot hand off customer experience issues over to another, or because your offering shows signs of poor design.
8. Increased residual risk - the possibility of losing large amounts of customer or company data or not being able to operate with the loss of a data center, or through theft of credit card information.

Organizations get stale and stuck in ways of thinking, and this applies to their style of technology management. Companies begin to react, and can't anticipate events - or become complacent and are surpassed by competition due to external disruption to the market.<sup>6</sup> In short, when technology is unmanaged as a resource in the same way money supply is usually controlled by a central bank, you end up with situations that are sub-optimal from a profit perspective - or push you over the edge and destroys profitability.<sup>7</sup>

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<sup>6</sup> "The younger rises when the old doth fall" - Edmund in Shakespeare's King Lear, Act III, Scene 3. Especially if pushed.

<sup>7</sup> It will be interesting to observe the recent phenomenon of "IT consumerization" which actually lowers the barriers to the supply of technology. All an organization needs to deploy an application (e.g., salesforce.com or google docs/ team sites) is an intern armed with a credit card and a device with internet access. Where such supply is unmanaged, residual risk may be increased (especially for leakage of

## **A digression: disruption happens, and it is difficult to respond**

Think back to 2007. Before Apple introduced the iPhone, Carriers and cell phone manufacturers were complacent. They rode the wave of success from the late 1990s when they themselves supplanted Long Distance carriers through innovative pricing and the novelty and convenience of a basic mobile phone. These players were totally blindsided by the disruption<sup>8</sup> that Apple was to cause<sup>9</sup>, and were in a poor position to respond.

To follow Apple and its innovation in use cases, software and hardware integration, scale economies and battery performance, it took a long time for a decent competitor to emerge. The reason for this was Carrier/ manufacturer inertia - the complexity of their business and systems environment made it extremely difficult to respond, and very costly.

At first, the Carriers did not recognize the threat of Apple's innovation, possibly because it was easy to ignore something new. Then, the Carriers did nothing about the threat, as it was too hard to change the existing way they did business and systems. The Carriers responded with inadequate strategies to counter the threat, given the constraints put on them by their business processes and technology. Finally, the Carriers realized that they had to reinvent their phones and offerings. It even took another third party - Google - to help the Carriers and manufacturers find an alternative model and orchestrate their response to the iPhone, with limited success as far as capturing profitability out of the market.

## **Response: Technology Monetarism**

The questions that business face include dealing with inevitable change and Technology Inflation, and how to deal effectively with events. Some techniques that have become popular are, essentially, responses to how to cope with change. For example:

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proprietary information or financial information). At the same time, the relative cheapness and disruptive economics (especially reduced capital costs) may drive companies to utilize more cloud computing resources (with the potential benefits and potential downsides that this choice implies). However, a mixture of Cloud resources and devices combined with traditional technology environments, makes complexity even more of an issue for many companies in the short term.

<sup>8</sup> Note that history is rife with such disruptions even within living memory. Can you remember how you used to develop photographs? How people used to queue up to get cash from human tellers? How you had to wait in line to check out your groceries without having a "self service" option?

<sup>9</sup> Perhaps with the exception of AT&T, who helped Apple fund their iPhone project in exchange for exclusivity in the US market for 5 years.

- \* Lean. This methodology emphasizes simplicity over complexity: a recognition that complexity promotes waste, inflexibility and problems with scale.
- \* Agile. This technique promotes rapid, iterative communication between a group of developers and their customers. This works in a complex environment because it reduces formal communication overhead - sometimes at the expense of overall system coherence.
- \* Outsourcing and/or Rightshoring. In-house resources for common functions are often over-priced and under-utilized in comparison to firms that specialize in such functions. However, many companies get sub-optimal results when such functions are overly customized.
- \* Abstraction, compartmentalization and modularization. Use of architectural and engineering techniques to mitigate inherent complexity.
- \* Operational techniques. Use of empirical techniques to manage complexity in a manner that is tactical (i.e., systems are kept “up,” but underlying causes of the complexity are not necessarily solved nor understood).

Unfortunately, isolated implementation of such techniques is not enough if a business wants to get ahead of inertia. The missing element is “joined up thinking” - and applying a Technology Monetarist mindset, including:

1. An emphasis on the controlled supply of technology within an organization.
2. An emphasis on order, hierarchy and relationships - to systematize complexity so that a problem, process or opportunity can be explained logically, simply and intuitively.
3. A view of a business as a system - with human, cultural, organizational and technological dimensions.
4. A bias for action, simplification and measurement of performance.
5. A recognition that technology problems require co-operation to solve, and technical problems cannot be isolated. Too many isolated decisions lead to bad economic and technical outcomes.
6. An independent review of arguments, facts and data - without silo, ego or vested interest thinking.
7. A proper orientation of the “cash machine”<sup>10</sup> side of the business, separate from the “strategic”<sup>11</sup> side of the business. Each side has different purposes when it comes to the purchase and use of technology.

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<sup>10</sup> This orientation is built around the core cash generation of the business and the optimization of its processes (a “cash machine”). This requires “operator” type skills - found in the majority of the population. The nature of this organization is conservative, and focused on the economics of production, customer satisfaction and the development of a “sticky” customer relationship. The key realization for executives must be that the life of this organization, once established, is finite and will inevitably be overtaken by new cash machines that are developed separately to supplant the original cash machine. This avoids a key mistake of corporations who try to mix in the evolution of new business within the operations organization. Cash machine priorities kill the new offering organizations, because of conflicting long term and short term interests.

<sup>11</sup> The second orientation is strategic, and focused on developing new business models or markets - and even cannibalizing the existing cash machine. This type of organization needs to have the creative and strategic skills to understand not only what customers demand, but also what they need. Such skills are

