

**Opinion Paper**

## **Agile Economics**

A robust method for economic evaluation & controlling  
of game changing innovations like Big Data

2014 / 10



Consulting  
**DETECON**

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# 1 Executive Summary

There are currently many hyped innovations like “Big Data” or “The Internet of Things”, which are at their “peak of inflated expectations”. They might evolve into promising game changing innovations for telecommunications and would probably impact many other sectors of the economy as well. From a controlling perspective, under these circumstances the typical “hockey sticks” are appearing on the revenue side of business cases while at the cost side, everything seems to be under control.

But in reality nobody knows exactly what the impact of the game changer will be. In most large organizations, the problem of classical innovation controlling methods is that they are mostly “waterfall” alike: They start with an idea, work it out in a feasibility study before making a detailed design and so on. Each time a gate to an ensuing phase has to be passed, the business case should be more precise with less risk involved. At first glance all seems to be “nice and dandy”; but what if the assumptions of these business cases are mostly based on paperwork only and at best occasionally enhanced with some technical pilot facts that are predominantly provided by vendors?

Because there is very little room for investment to conduct market pilots in the early phases of classical innovation methods, the resulting lack of factual market evidence makes it very difficult to substantiate revenue assumptions. Not surprisingly, after a while the bubble bursts, resulting in a “deep trough of controlling disillusionment”: Business cases need to be deflated, business plans adapted, etcetera. Resources are subsequently wasted on explaining “why things happened”, but there is hardly any resource left to solve the core problem, since there was too little money spent upfront to get hands-on factual proof for the business case. Unfortunately, the result is that projects are put on hold or shelved; the accumulation of hands-on knowledge stops. When the game changer materializes, you are actually too late to be really successful on the market...

To prevent this from happening, controlling methods for innovation must evolve in our opinion. Waterfall based approaches must be left behind for “game changer” innovations and controlling methods have to become agile in order to get more control and manage risk proactively: Agile Economics.

Agile Economics is a novel innovation controlling method, which allows game changing innovation business principles to be tested in practice, so that business cases are based on hands-on factual evidence. Agile Economics uses iterative learning cycles, which ensures proven business models and cases. In each cycle, knowledge is captured by conducting pilots validating the revenue and cost assumptions of the business model.

It recognizes successes and unexpected positive side effects, but it also captures facts that do not support the case. Since the method is based on real life pilots, it reduces the risk of bubbles to grow. Moreover, it speeds up decision times, since it only allows for a limited and transparent amount of Capex to be spent per cycle and each time both the revenue effects and cost side need to be proven. Agile Economics especially fits into a Big Data context since it is based on the concept of value of information.

As Agile Economics is based on statistical economics, the risks of innovations are quantifiable in a more sophisticated and proper manner and can be systematically evaluated and managed. According to our opinion, by adopting this method time to market reduces;

“Paralysis by Analysis” is prevented and risks are handled better, because Agile Economics is based on real data instead of speculative forecast models and explicitly quantifies risk. It is cost-effective, since money is only allocated step by step and conditionally; therefore, more cash will be left to diversify or investigate other possibilities. Agile Economics thus increases investment control.

## 2 Waterfall control methods harm game changing innovation

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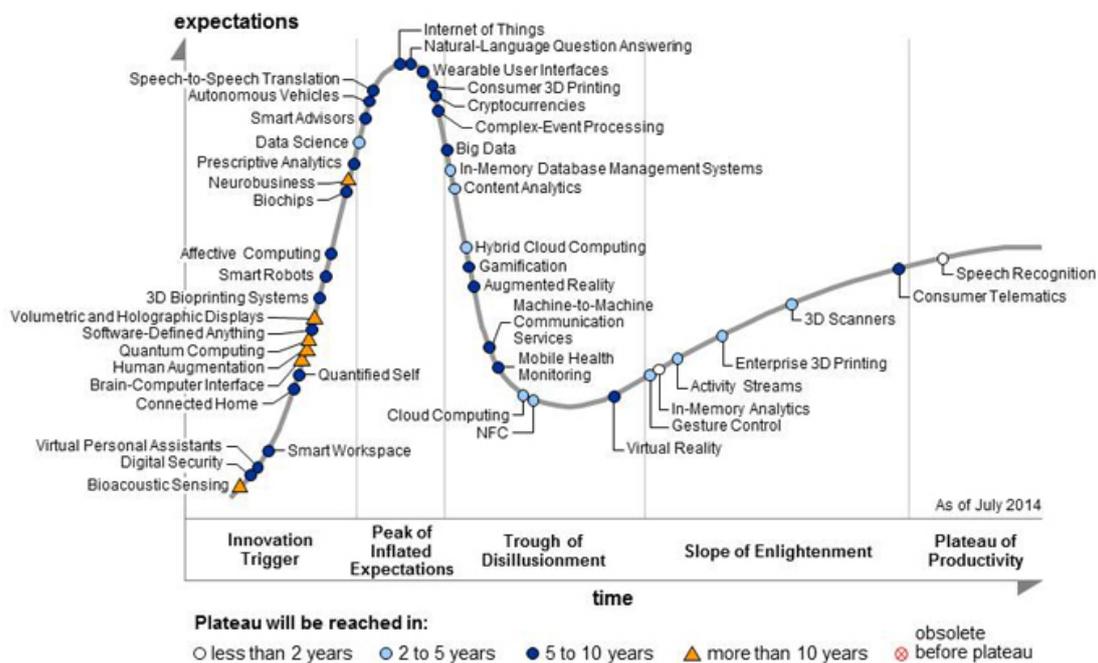


Figure 1 Gartner's Hype Cycle for Emerging Technologies (Gartner 2014)

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deflated, business plans adapted, etcetera. Resources are subsequently wasted on explaining “why things happened”, but there is hardly any resource left to solve the core problem, since there was too little money spent upfront to get hands-on factual proof for the business case. Unfortunately, the result is that projects are put on hold or shelved; the accumulation of hands-on knowledge stops. When the game changer materializes, you are actually too late to be really successful on the market; a vicious circle appears....

### **3 Agile Economics quantifies business cases from experience**

Agile Economics is a novel innovation controlling method which allows game changing innovation business principles to be tested in practice, so that the business cases are based on hands-on factual evidence. Since it is based on statistical economics, the risks of innovations are better quantifiable and can be systematically evaluated and managed.

#### **3.1 Principle I: Learn to understand the game changer iteratively**

For many game changers it's very hard to assess on paper beforehand what the game changer would economically bring. Waterfall based innovation methods introduce risk:

1. They usually do not allow for enough budget to experiment with technology extensively and thereby force teams to solely work paper-based;
2. In the "hype phase", forecasts cannot be relied upon since they are not based on historic proof;
3. Marketing research techniques do not reliably work, since consumers in panels or questionnaires cannot unfailingly envisage the impact the innovation could have;
4. Since the idea is in its infant stage, it is very hard to incorporate the learning and side effects in the waterfall. It often requires a new project introducing a large administrative cost burden.

Some large organizations think that providing a small pot of money for exploring new technologies would offer a universal solution to this problem. The answer is that it does not, since it only considers (one particular) technology or is highly product-focused. Usually, some "sexy" use cases are considered in flashy PowerPoint presentations, yet any real testing of especially the revenue side of the business models gets too little consideration. Here Agile Economics can offer improvements:

It forces one to set-up a business model first and find a sufficient proof in real life pilots. The pilots are not only used to test the technology and estimate potential cost, but also to seek for validation on the benefit side of the business model as well.

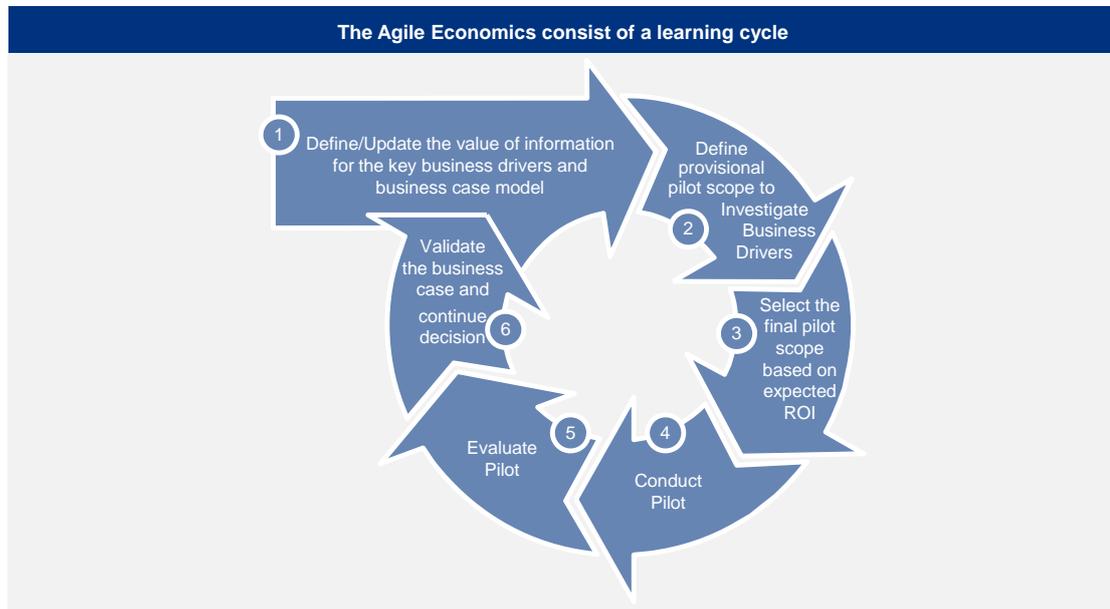


Figure 2 The Agile Economics learning cycle (Wisselink et al., 2014)

By using real world business driven pilots, Agile economics increases the likelihood of success through the systematic and iterative gathering of information. The relatively small size of the pilots limits the initial investment, thus breaking the vicious circle of game changing innovations:

1. Define/Update the business (case) model by focusing on the economic value of information to be defined and validated in the pilot: Define economic criteria;
2. Set-up of the provisional pilot scopes based on validating economic criteria (technology selection, test population etc.);
3. Final ranking and selection of pilot scope elements based on expected ROI or other suitable criteria of the pilot;
4. Conduct the pilot using a measurement framework to validate the business drivers;
5. Evaluate the pilot, focusing on the business drivers but also capturing unexpected side effects;
6. Validate the business case and decide how to proceed further.

### 3.2 Principle II: Acknowledge risk and uncertainty

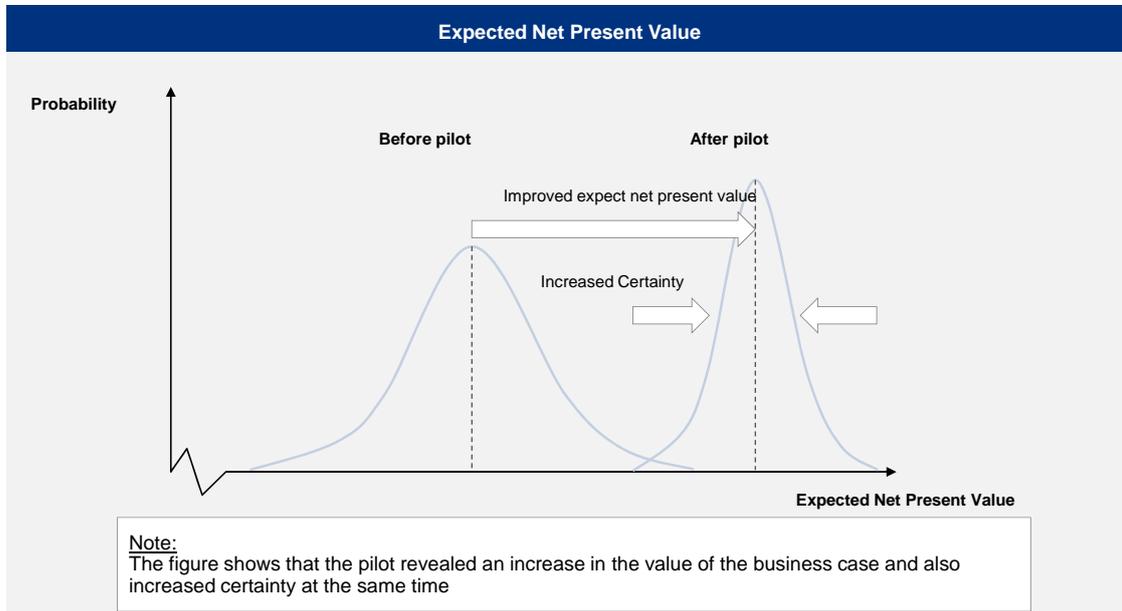


Figure 3. The effects of conducting business experiment on risk (Wisselink et al., 2013)

The second principle of Agile Economics is to explicitly account for risk and uncertainty in the methodology. The business case model approach of Agile Economics is an adaptation of a methodology prevalent in the Oil and Gas industry. It is based on distributions for its variables, thereby not only capturing the assumptions more easily since “experts” are allowed to give a realistic assessment, but also the accuracy of those assumptions.

Another benefit is that Agile Economics produces not only the standard economic project evaluation criteria, but also numerical values of the risks involved in those criteria. The required Monte Carlo simulations are supported by proven standard software, Oracle Crystal Ball being the quasi industry standard.

### 3.3 When to return to the waterfall

Agile Economics is not a “magic solution” and is not advisable for all problems. In order to apply its methodology, some preconditions have to be fulfilled: For instance, the set-up cost of pilots are limited and scalable to the extent that they are lower than the expected value of information the pilot delivers. Also, test populations need to be accessible to conduct pilots.

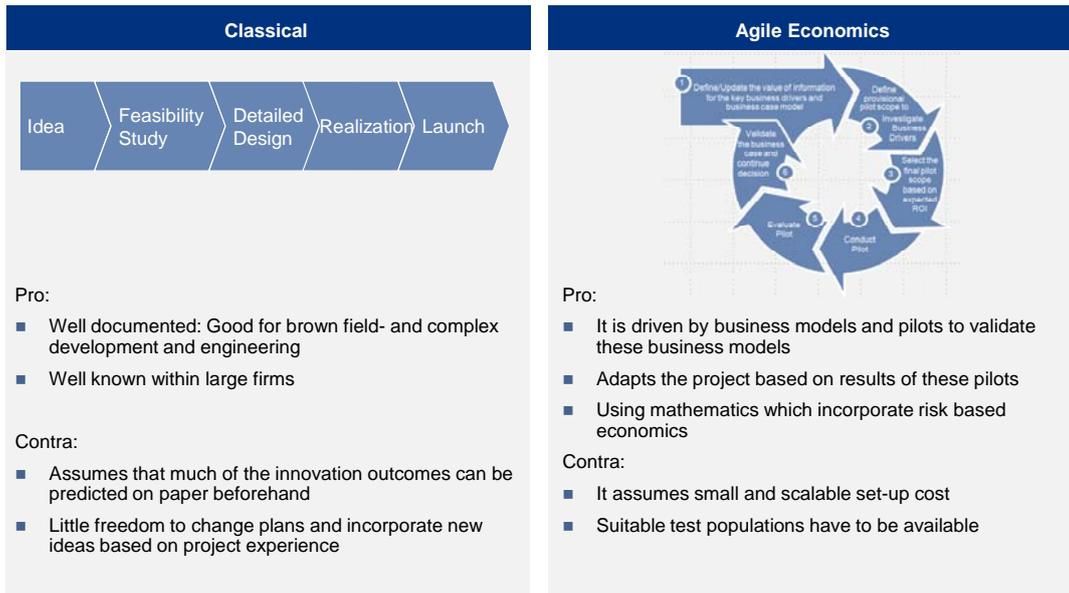


Figure 4 Pros and cons of Waterfall versus Agile (Wisselink et al., 2013)

Especially in problems concerning game changers with high uncertainty and little knowledge about the outcomes, Agile Economics will be of significant help. However, in Brownfield engineering where there is ample experience and where results can be predicted, waterfall-based methods can do no harm.

## 4 Solving the Big Data hype is one of the key application areas of Agile Economics

The nature of Agile Economics makes it especially suitable for Big Data:

1. Its statistical nature closely aligns with the idiosyncrasies of Big Data;
2. Since it based on the concept of the Value of Information, it directly addresses the core parameter to validate within Big Data applications;
3. Since Big Data is a still in a hyped phase, it is very hard for organizations to make sound economical assessments.

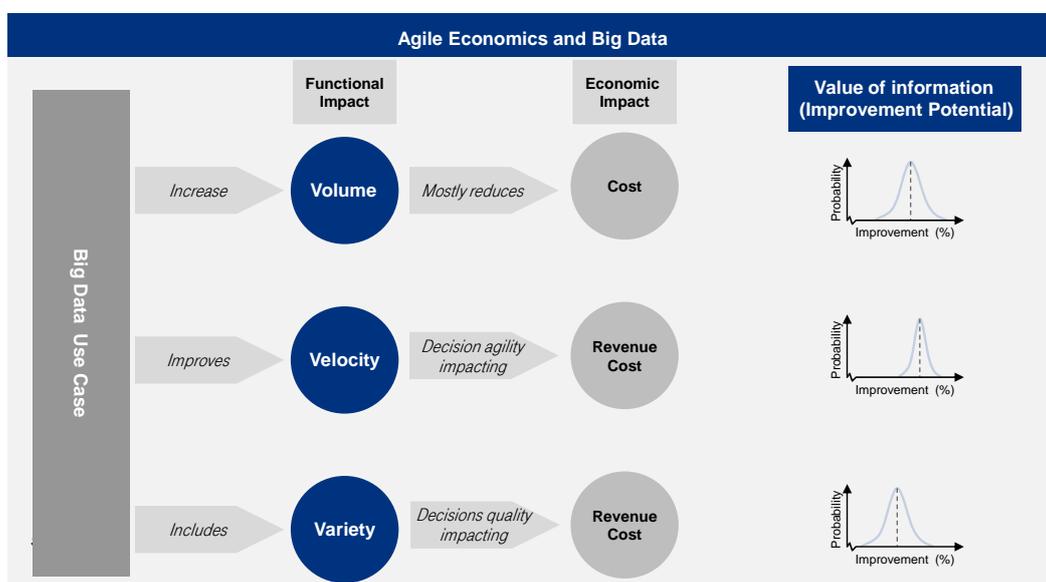


Figure 5 Agile Economics and Big Data

In Agile economics, the Big Data uses case is split in its constitutive effects, as depicted in Figure 5.

The model is based on the 4V definition of Big Data (Wisselink et al., 2013):

**Volume:** Big Data technology should be able to deal with large volumes of data. The promise of Big Data is that multiple tens of terabytes (the size of a current storage solution) can be processed in minutes and a total volume in the range of petabytes (=  $10^{15}$  Bytes: equivalent to the size of thousands of current hard disk drives) can be managed.

**Velocity:** Big Data technology should be able to analyze the large volume of data quickly. The performance promised by Big Data systems is the support of right-time data processing. With right-time we mean that the result of data processing must be available when operationally needed, which is not necessarily real-time. For instance, Big Data must be able to interpret the threads on social media quickly enough to detect changes in "mood", so that steering customer perception proactively will be possible.

**Variety;** Big Data technology should be able to handle several types of data. It should not only be able to find answers in data which is highly structured like transactional data (e.g. billing data), but also be able to create information out of sources with very little structure or none at all, like emails or customer calls.

**Value** is the expected Net Present Value for Big Data investments which the model analyses.

Examples for the functioning of the model described in Figure 5 are described below:

A Volume effect, for instance due to a migration of a classical data warehouse to a Hadoop cluster, mostly leads to a cost impact. Out of previous experience this results mostly in a cost improvement per stored volume, however only with a certain degree of certainty. Therefore the Value of the Information to be validated is the cost reduction potential, which is to be validated in the cycle of Figure 2 (page 8). Since the cost saving potential varies on a case-by-case basis, the improvement potential is a distribution (Value of information improvement potential in Figure 3, page 9.).

Another example more leaning to the value of information is the Velocity aspect of Big Data. Here one should ask oneself the question: *“Which economic contribution does it have if I would know this sooner?”* The velocity element of Big Data can be cost impact, for instance the reduced handling time in a call center or the revenue effects or decreased revenue churn since it can facilitate improved decision speed.

Variety can increase the quality of decisions by combining several types of data: It concerns the answer to the question: *“What economics advantage would it have if I would have known this in more detail?”* Combining highly structured (transactional) data with data having very little structure like social media feeds is an example of this. Service performance can thus be improved, leading to revenue increases or cost savings depending on the use case.

Another example for variety is predictive maintenance. Different indicators for wear and tear are collected and correlated in order to conduct maintenance before actual breakdown occurs, thus saving cost.

## 5 Agile economics increases control over game changing innovation while decreasing time to market

Since Agile Economics is based on statistical economics, the **risk** of innovations is better **quantifiable** and can be systematically evaluated and managed. By adopting Agile Economics, **time to market reduces**; “Paralysis by Analysis” is prevented and risk is minimized, since it is **based on real data** instead of speculative forecast models and explicitly quantifies risk. It is **cost-efficient**, because **resources** are only **allocated step by step** and **conditional**. Therefore, more cash will be left to diversify or investigate other possibilities. Agile Economics thus increases investment control and is especially helpful to manage Big Data game changers.

## 6 Further Reading

- Gartner 2014 Press Release, Gartner's 2014 Hype Cycle for Emerging Technologies, August 2014
- Wisselink 2013 Intelligent Business by Big Data, Detecon Opinion Paper, July 2013
- Wisselink 2014 Smart Cities: Streetwise methods to explore mobile business opportunities, lecture Frankfurt Goethe University, July 2014

## 7 The Authors

**Frank Wisselink** gained a wide experience in industry reaching from oil and gas sector, electronics to telecommunications before joining Detecon. The last 8 years Frank managed and contributed to key innovation, change and strategy projects within and outside the Deutsche Telekom Group. He specialises in optimising the business benefits of innovations like Big Data by integrating strategic, marketing, financial and organisational aspects. Frank holds a PhD in engineering and a BSc (Hons.) in Economics and Management of the University of London International Programmes conducted by the London School of Economics and Political Science.

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## 8 The Company

### **We make ICT strategies work**

Detecon is a consulting company which unites classic management consulting with a high level of technology expertise.

Our company's history is proof of this: Detecon International is the product of the merger of the management and IT consulting company Diebold, founded in 1954, and the telecommunications consultancy Detecon, founded in 1977. Our services focus on consulting and implementation solutions which are derived from the use of information and communications technology (ICT). All around the globe, clients from virtually all industries profit from our holistic know-how in questions of strategy and organizational design and in the use of state-of-the-art technologies.

Detecon's know-how bundles the knowledge from the successful conclusion of management and ICT projects in more than 160 countries. We are represented globally by subsidiaries, affiliates, and project offices. Detecon is a subsidiary of T-Systems International, the business customer brand of Deutsche Telekom. In our capacity as consultants, we are able to benefit from the infrastructure of a global player spanning our planet.

### **Know-how and hands-on expertise**

The rapid development of information and telecommunications technologies has an increasingly significant influence on the strategies of companies as well as on the processes within an organization. The subsequent complex adaptations affect business models and corporate structures, not only technological applications.

Our services for ICT management encompass classic strategy and organization consulting as well as the planning and implementation of highly complex, technological ICT architectures and applications. We are independent of manufacturers and obligated solely to our client's success.

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