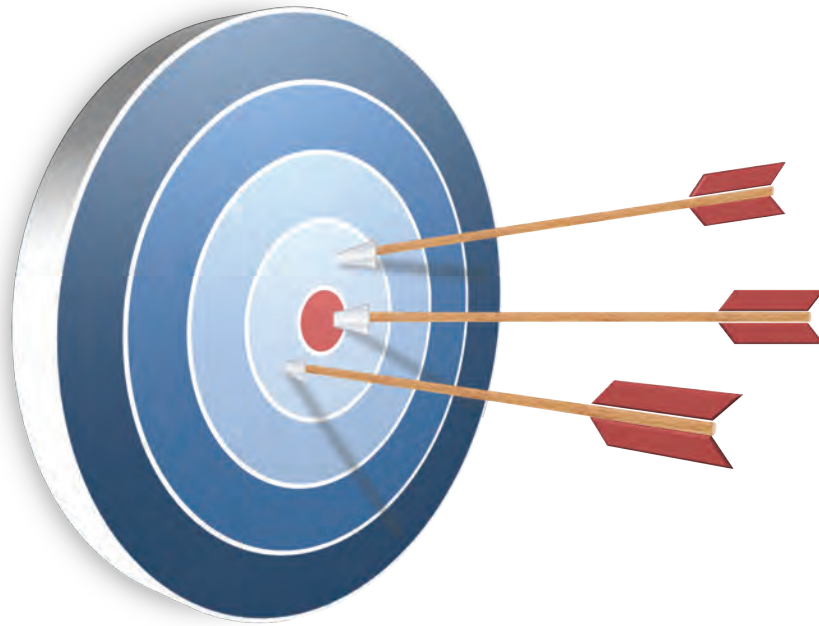




Target Analytics Maturity to Beat the Big Data Backlash

About the Author



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Following a career in academic research, Nick has worked in the commercial IT & Technology sector since 1999. His work has been wide ranging, including developing Tessella's award winning Asset Management and Performance Optimisation software.

Moving through technical roles in analysis and project management into a senior leadership position, Nick is now Head Of Analytics. The years spent crunching numbers to model and visualise the subtleties of chemical bond formation, complement those spent more recently solving practical problems in industry, to

give Nick a great feel for what you can do with data. In this role, Nick combines his knowledge with the weight of experience of his Tessella colleagues, to craft a comprehensive analytics resource, focussed on enabling radically better decision making under challenging conditions.

Keep up to speed with the latest thinking on analytics; follow Nick on his blog <http://analytics-lab.tessella.com/> and on Twitter [@Analytics_Lab](#)

The Big Data Backlash

In recent years, the media has been full of Big Data; talking either about its amazing potential or the privacy implications. With multiple vendors desperate to establish primacy, Big Data has been everywhere.

However, outside of established public-facing poster boys like Google, Amazon and Facebook, tangible progress has been patchy. It's all been a bit too hard, fighting against immature technology and a lack of available expertise. Quick wins have been few and far between. Reality has not lived up to expectation and Big Data is now sliding down the steep trough of the Technology Hype Cycle^{1,2} and experiencing a backlash.

This is causing business leaders to question Big Data, and analytics in general. Is it really a good fit for the mass market? Or is it just the marginal preserve of obsessive boffins who don't speak their language?³

The way to plan analytics on a big scale has not yet been sufficiently thought through. It's too easy to get lost navigating the technology hype and forget why you were doing analytics in the first place.

As well as describing the many opportunities, the McKinsey report⁴ of 2011 was also clear about the challenges that face industries wanting to transform for the Big Data age. When McKinsey returned to the subject in March 2013,

it was to highlight the struggle many are finding in getting to grips with this new world.⁵

A common sticking point has been the integration of something very unfamiliar into traditional business planning. Those outside of niche technical teams struggle either to understand it sufficiently for themselves, or get clear answers from their Big Data experts. And as many are finding out, the delivery of analytics from Big Data without a strategic plan is unlikely to end well.

In this paper, our aim is to make it easier to plan that journey to becoming a more effective user of analytics. There is no big secret, and no silver bullet. We offer instead a structured way of thinking about, organising and communicating your route to greater analytics maturity. We have developed a Maturity Model that comprises: Three Pillars of maturity which support Five Tiers of proactive analytics, and a clear visualisation of the strength of your analytics profile.

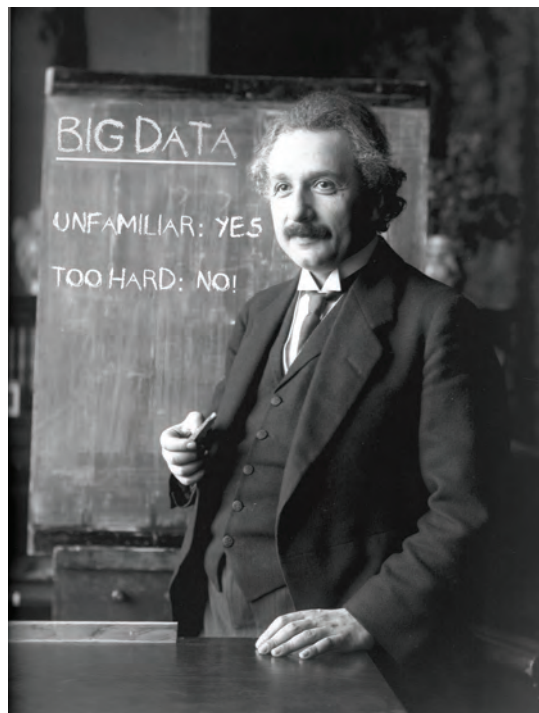
Our aim is to help you work towards a greater use of proactive analytics, to improve the choices you make about the future. There lies the greatest competitive advantage. You will find that incorporating our ideas into a structured analytics plan is not such a big leap. It's all about taking control. Here we give you the tools to do just that, and beat the Big Data backlash.

“Quick wins have been few and far between. Reality has not lived up to expectation and Big Data is now sliding down the steep trough of the Technology Hype Cycle and experiencing a backlash.”

De-mystifying Big Data

Before we tackle analytics maturity in earnest, a quick word is in order, to put Big Data in its place. Though Big Data introduces some important new elements into analytics, it's not as challenging as many would have you believe. In our experience, it's important not to confuse the unfamiliar with the inherently complex. Once you break through the jargon, it looks rather familiar. It's important to realise that Big Data is just one part of a broader analytics spectrum; a family of techniques which provide valuable information that cannot be discovered by easier means. We encourage you to put Big Data to one side for a while, and

concentrate instead on identifying your ultimate goals. Start by understanding the problems you face, the decisions you want to improve and the new insight and information you need to achieve it. This puts you in the much more familiar realm of analytics and decision support. In this White Paper, our focus is on planning to deliver analytics in the round. All of what we cover here applies equally to Big Data initiatives as it does any other blend of analytics. In a companion White Paper, we will analyse in more detail the new elements introduced by Big Data, what advances they offer for analytics, and the best way to incorporate them.



“Though Big Data introduces some important new elements into analytics, it’s not as challenging as many would have you believe.”

Analytics Maturity Explained

What is Analytics?

It's important to be clear from the start about what is meant by analytics and what constitutes maturity in its use. To us, analytics represents:

The processing of measurement data in order to generate a greater level of insight into, or understanding of, the process or 'thing' being measured than could be obtained from the individual data points.

The output of analytics is some new level of knowledge that can be acted upon, by man or machine. In any specific case, the underlying data could be big or small in either volume or complexity. It is all analytics, just delivered using different technology and techniques.

As for "what is maturity?", the dictionary offers "The state or quality of being fully grown or developed", but is otherwise rather coy. It seems to be as much about the absence of one thing as it is the presence of another.

We find it helps to think in terms of immaturity, and its associated character traits: missing the big picture, a lack of forward planning and self-discipline, exhibited in a tendency to do what you most **want** to do rather than what you **should** do. Put simply, maturity means getting the most out of analytics that you could expect given your available data.

To achieve this, you need to be able to:

- Identify, characterise and prioritise the most important problems,
- then design analytics systems that squeeze the most additional insight or knowledge from the data, to deliver the biggest impact on solving those problems.

The "I want!" desire of technical experts to dive in and play with new data and the latest software tools can be very strong. It can overpower the "I should", namely ensuring that you meet your prioritised business needs. Our Maturity Model keeps you strictly focussed on the "I should", and provides you with a clear planning structure to achieve it.

Getting the Best Analytics Profile

The collective **analytics profile** of an organisation can usually be viewed as a loose programme of individual systems, many of which can be essentially independent of one another. Each will have its own history, purpose and lifecycle, having been initiated in response to a specific motivation. It's important not to think of each system as a large heavyweight project. It could equally be a lightweight and agile response to a specific problem.

Identifying and delivering "quick-wins" is an essential part of developing analytics maturity, as it builds support and confidence of senior management.

Part of the Big Data backlash comes from too much "big bang" and not enough "quick win". The aim is to build a profile that achieves the right balance.

In our experience, we often come across analytics profiles that consist of many systems that do not take advantage of readily available and proven analytics techniques. These systems are largely unaligned either to one another or to any central business strategy. They certainly

do not make anything like full use of the available data.

A more mature profile will use the full range of analytics in a more strongly coordinated way. This is easy to state, but how in practice do you spot the difference between a strong or weak analytics profile?

Our Analytics Maturity Model is a combination of tools that allow you to assess your analytics profile:

Tool 1: Three key criteria by which each system should be identified, planned and implemented

Tool 2: Each system is given a score based upon its balance between backwards-looking reporting and forward-looking predictive power

Tool 3: Visualisation of the complete profile 'grouping' on the Analytics Maturity Target

Analytics Maturity Explained

Proactive vs Reactive Analytics

A key part of planning your analytics profile is to rate each individual analytics system according to the type of decision that it is designed to improve. The rating is based on a sliding scale between the following two extremes: a reactive, backwards-looking decision made in response to information about past events and a proactive, forward-looking decision taken to influence positively a future event.

A reactive decision is typically made to prepare for or minimise the adverse consequences of a damaging incident, such as a component failure or sharp drop in sales. A proactive decision is all about taking the initiative, acting on early warnings and optimising future outcomes. This is the realm of predictive analytics.⁶

Tool 1: The three pillars of analytics maturity

Our Analytics Maturity Model is built upon three pillars:

1. **Right decision:** Understand your most pressing problems, and which decisions will benefit from greater insight.
2. **Right balance:** Identify, for each key decision, the appropriate balance between a reactive and proactive system; aim for more proactive analytics tools whenever possible.
3. **Right execution:** Implement each project strictly according to the strategic analytics plan: it must be driven by the decision it needs to support, not the data you have to hand.

By basing their analytics planning upon these three pillars, an organisation's analytics profile will gain greater maturity, one new system at a time.

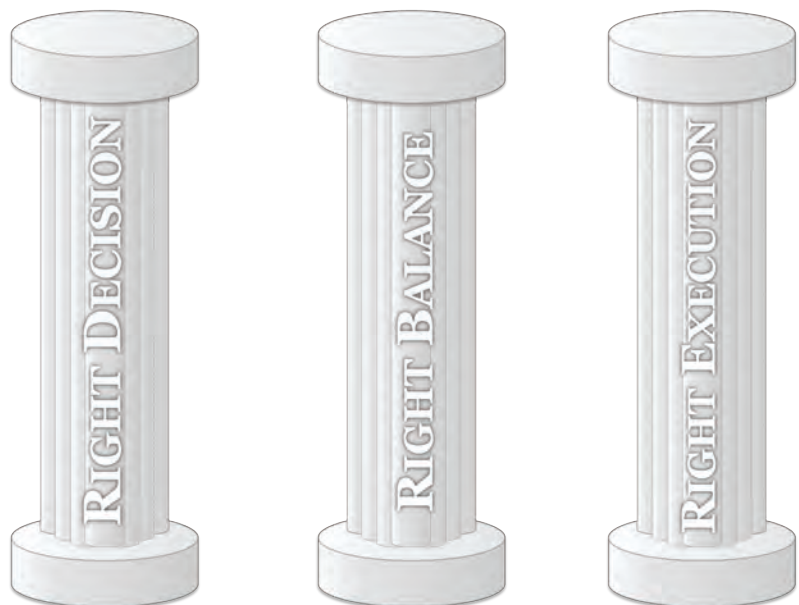


Figure 1 - The three pillars of analytics maturity

Analytics Maturity Explained

Tool 2: The five tiers of proactive analytics

To aid planning and communication, we separate the range of analytics systems into five discrete tiers, in order of increasingly proactive decisions:

Tier 1: *What was* - reporting on the past, what happened, when, where and how many

Tier 2: *Why was* - analysis of the past using statistical and other models to rationalise why things happened as they did

Tier 3: *What now* - using models to forecast the consequences of known past events

Tier 4: *Where next* - predictive analytics modelling of the probability and impact of future choices

Tier 5: *Where's best* - gaining sufficient control of your predictive models to make realistic choices that optimise future outcomes

This represents a steady progression from a purely factual reporting of past events, through layers of increasing interpretation of why the events happened as they did. As we move to higher tiers, the models delivering the interpretation become increasingly predictive, using the insight gained to improve future decisions. Understanding where each system should be placed between these extremes, and when and where to use which tier of analytics tool, is one of the keys to maturity. In real life, the choice will be a matter of experience and judgement, rather than any set formula. One size doesn't fit all in the analytics world, and we'll look more closely at ways of making the right choice later on.

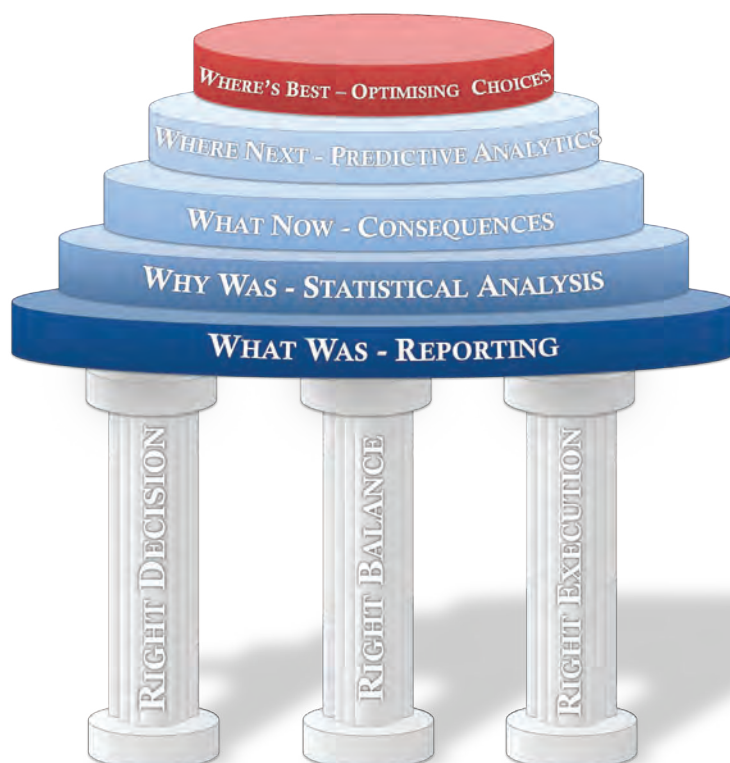


Figure 2 – The three pillars support the five tiers of proactive analytics

Analytics Maturity Explained

Tool 3: The Maturity Target

“True analytics maturity comes with accurate identification of those key business needs that can be addressed via analytics; and an understanding of the appropriate level of proactive analytics to adopt.”

The next step in our Maturity Model is to visualise the complete profile of an organisation's analytics systems. The foundation of the visualisation is an analytics maturity target, where each ring represents one of the Five Tiers. Each individual analytics system is marked as a point on the target, at its appointed Tier. Add every system and you will see the grouping pattern of the analytics profile. Reactive, backwards-focused systems sit in the lower scoring outer edges. The closer you get to the centre, the more forward-looking the analytics becomes. You've hit the bulls-eye when the system combines your knowledge of the present with your learning from the past, in a way that can optimise the choice of future actions from a range of alternatives. This is an easy way to understand and communicate where each individual system sits within the combined Maturity Model and how it contributes to the overall goal of moving the organisation towards greater use of proactive analytics.

Note, the optimum grouping of a mature profile (unlike for an Olympic rifle champion) is not necessarily to have all of the scores closely bunched together in the bulls-eye. This can be a poor use of resource and is heavily over-engineered. True analytics maturity comes with accurate identification of those key business needs that can be addressed via analytics; and an understanding of the appropriate level of proactive analytics to adopt. The more proactive the analytics, the more potential there is to change business processes. Any organisation can only cope with so much change at any one time, so a phased approach is essential. While the optimal grouping pattern will vary from case to case, a broad and well balanced spread across the Tiers will typically indicate a more mature use of available analytics resources.

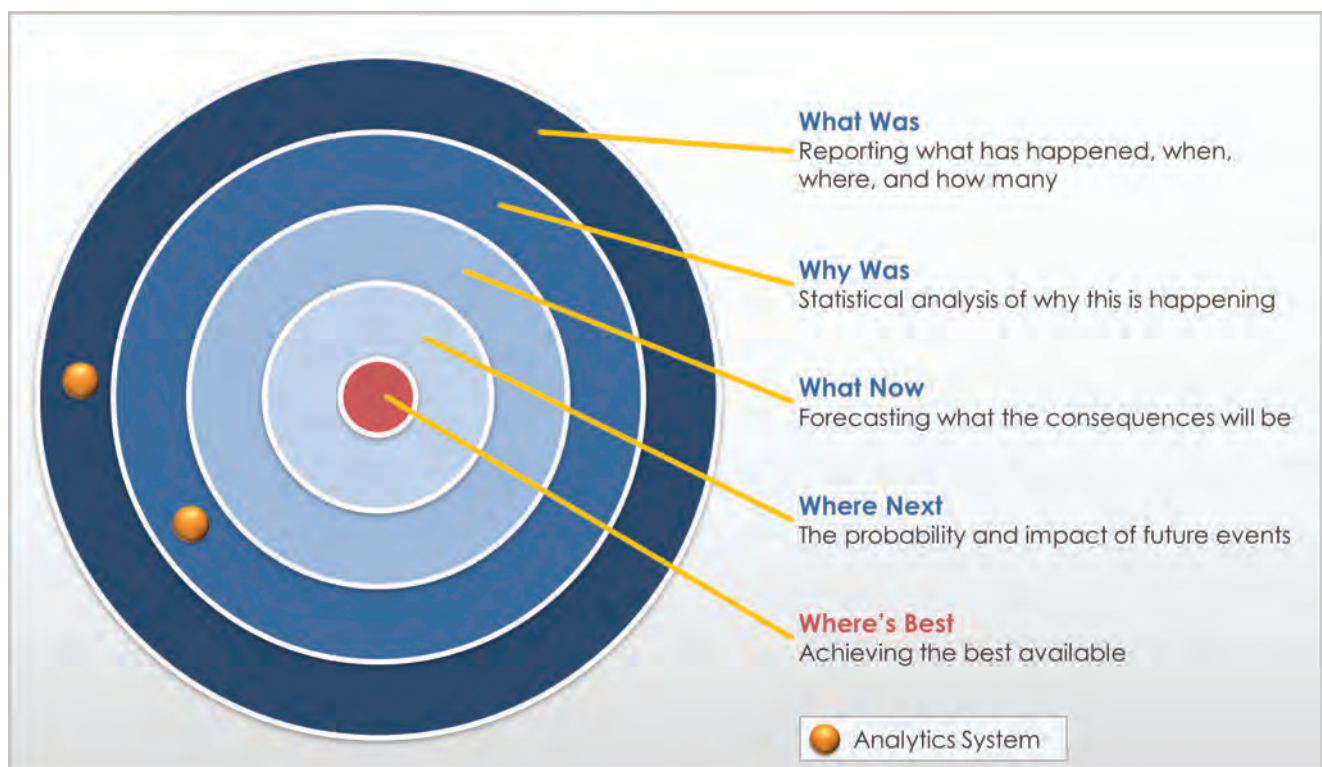


Figure 3: The Analytics Maturity Target

Analytics Maturity Explained

Maturity Snapshots

Any single target provides a snapshot of one point in time. Multiple targets can be used to visualise the path from where you currently are to where you are aiming for, as new analytics projects are completed. Commonly, systems will be delivered in stages which span different analytics Tiers. A predictive Tier 4 system, for example, will often build upon the data sources and output from early stage analytics tools delivered via a Tier 1 or 2 system. Seeing the scores for the higher Tier systems appearing on the target closer to the bull's-eye makes this method of visualisation an excellent indicator of the rate of increasing maturity, as the overall organisational analytics programme progresses.



Figure 4: Contrasting maturity profiles

Hitting the Bull's-Eye

The introduction of new planning tools, such as our Analytics Maturity Model, only delivers truly effective results when used widely, consistently, and in a coherent manner. In our experience, many organisations find it surprisingly difficult to achieve this. The solution to this is to bring together, for each case:

- the right people
- with the right skills
- and the right experience
- and give them the right tools
- to generate the right insight from the right data

In Tessella we call this approach “Building a Virtual Analytics Laboratory”. We describe it in detail, with example case studies, in our earlier White Paper: *Can You Win The Big Data Arms Race?*

Hitting the Bull's-Eye

The Virtual Analytics Laboratory



Figure 5: The Virtual Analytics Laboratory

We define a laboratory as any place in which you test new ideas and theories or existing prejudices, ideally whilst exerting control over the measurement conditions.⁸ Whether you are testing chemicals, the progress of a disease, people's behaviour or looking for the Higgs boson, there are many things in common. It's all about furthering knowledge in a controlled, repeatable manner.

For a traditional laboratory to be effective, you need to assemble the right mix of problem domain knowledge, skilled investigators, experimental techniques and results analysts. In the 21st century, there are many kinds of laboratory and they all have this same basic need. We have found that analytics laboratories, based on very similar principles, are a particularly effective and practical vehicle for delivering greater maturity.

The great advantage we have now is the Internet. Our analytics laboratories can be virtual, with distributed teams applying analytics as experimental tools on data to generate new insight. The key to success is to achieve the broad mix of business representatives, IT and technical analytics specialists represented in the figure above. Both strategically focused and operationally experienced viewpoints need to be heard. Not only will the right problems be identified, but also pragmatic, achievable solutions will be found, based upon hands-on knowledge of the day-to-day business. The virtual analytics laboratory structure is a great technique not only for strategic and operational planning, but also for project implementation. The makeup of the laboratory team for each phase will reflect the specific needs, but retention of continuity is very important. To deliver effective decision support, it is essential that those designing the system understand in some detail:

- how the decisions are actually made by people on the ground
- what the underlying data measurements actually represent
- how to deliver the insight to the decision maker at the time its needed

It is clear that this can only work through access to a broad range of skills and knowledge.

Hitting the Bull's-Eye

Breaking Up the Silos

It is no accident that the structure of the virtual analytics laboratory spans different traditional organisational boundaries, many of which typically do not work well together. We have seen many times how organisational silos undermine the path to analytics maturity. There are three main silo types to be wary of when planning an analytics programme:

- **People:** When the limited number of people with the knowledge and skills to design and deliver transformational analytics are “owned” by one part of the organisation and not made available more widely. This includes technical skills and knowledge of the business.
- **Data:** When underlying data that could be of value across an organisation is locked within a localised system.
- **Knowledge:** When new insight is not shared outside of the locality in which it was created.

These silos can be fatal to the development of analytics maturity. As data becomes bigger, both in volume but especially in complexity, then it increasingly no longer respects traditional organisational boundaries.

To get the best return from the investment in collecting and managing this data, and to be an effective analytics organisation, you have to find the way to make best use of your best people.

Our virtual analytics laboratory concept was inspired by the rise of the interdisciplinary approach to science and the proven success bringing different ideas and experiences together to tackle afresh some of the hardest problems. A great example is nano-technology, a powerful combination of condensed matter physics, chemistry and biology.⁹

The fusion of different ideas, and the disruptive (in its positive sense) nature of new collaborations, is proving to be a great environment for innovation. There is the potential to achieve similar levels of innovation in the effective delivery of proactive analytics.



“These silos can be fatal to the development of analytics maturity. As data becomes bigger, both in volume but especially in complexity, then it increasingly no longer respects traditional organisational boundaries.”

Hitting the Bull's-Eye

Decisions First, Data Last: The Planning Chain

The final part of the maturity model goes deeper into the 3rd Pillar, namely **Right Execution**. The IT systems that do get implemented are often those with data sets that are easy to collect, already exist or belong to the technically most enthusiastic. These are not necessarily the systems that the business needs.

Unfortunately, as a technical expert it can be quite hard not to start a new information system by focussing upon the data. It is a tried and tested methodology used by IT departments the world over. This data first approach, however, is not the direction in which you should **plan** analytics. Your analytics planning must be decision-driven. We call this the "Decisions First, Data Last" planning chain. It is the key message of the 3rd Pillar.

Decisions First



Data Last

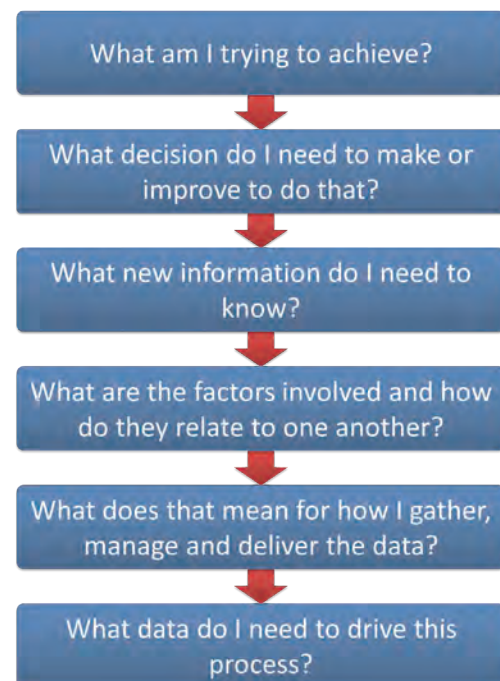


Figure 6: The Decisions First, Data Last planning chain

It's common sense. Until you know which decisions to improve, you can't plan to generate the insight to support them. Until you know the insight required, you can't plan the analytics to deliver it. And so on, back down through the planning chain to end up identifying exactly what data is needed. When you plan, you start with the decisions and only worry about the data at the very end. In our experience, many analytics projects fail because they approach the planning chain from the wrong end. They go in data first.

By design, the interdisciplinary structure of the virtual analytics laboratory is excellent protection against this fatal flaw in project execution. The coming together of people from different levels, with different viewpoints and experience, for a common purpose, demands a level of discipline and transparency in decision making not always found in more narrowly-delivered projects. There are powerful checks and balances inherent in finding a common language to suit big picture thinkers, strategic planners, end users and technical specialists. The larger number of viewpoints doesn't make it harder to find the right direction. The clarity that comes from focusing on decisions first actually makes it easier.

Hitting the Bull's-Eye

Maintaining Continuity: The need for a strong centre

The co-opting of experts from different departments onto a cross-function working party can easily suffer from a familiar problem. After initial enthusiasm, the focus ebbs slowly and steadily back out to each of the home departments.

The operational pull of the day job always dominates, and it only takes a few local crises to fatally undermine the working party. Good intentions are sacrificed to the daily running of the business.

A simple, but essential, measure will protect the virtual analytics laboratories against this fate; dedicated team members as a central permanent core, augmented by the co-opted experts from the traditional departments.

Often with a mix of analytics and project management skills, their role is to maintain momentum and act as a counter pull to keep the wider team together.

The core doesn't have to be a large team, and they can be spread over several different virtual laboratories. Insulated from the operational crises, they keep the project moving forward and reach back out to the affected team member as soon as possible, act as their proxy or arrange for replacement members to be co-opted. If the dedicated central team is brought in from outside the organisation, they remain free both of any historical personal baggage that can affect inter-disciplinary teams or the perception of group preference.

Conclusion

Competitive advantage through analytics maturity

These days, we are used to having decisions guided by research, metrics and KPIs. Today's data sources make it possible to measure so much more. We should strive to do more with it. However, the majority of analytics systems doggedly remain more reactive than proactive. Even Big Data projects lean more towards raking over the past than forging a better future. It is our view that aiming to shift the balance of your analytics profile to becoming more proactive is a key measure of increasing maturity.

The goal should be to evolve your analytics to become a more powerful fusion of past learning, present knowledge and predictive modelling. They should enable future decisions to be evidence-driven where possible, and as near to optimal as makes economic sense. We are in no way saying that every problem needs an ambitious forward-looking analytics system. However, we are saying that the business case for investing in improving the future is often stronger than the case for coping with the past. We think that harnessing the predictive power of analytics is one of the key indicators of growing analytics maturity. It's where the greatest competitive advantage is to be found.

The predictive power of analytics, with a growing list of compelling case studies, is increasingly well documented.^{6,10,11} One has only to look at the fame enjoyed by Nate Silver after the 2012 US Presidential election.^{12,13,14} We have introduced in this White Paper a multi-stage Analytics Maturity Model to support a more structured approach to planning. It provides a robust framework from which to reap the benefit of these predictive techniques, and to support more proactive decision making.

If you want your data to be put to work repeatedly and effectively, rather than just being scanned once and left to collect dust in a data warehouse; if you like the idea of a proactively planned, evidence-driven approach to a better future, then contact Tessella.

Our rigorous combination of scientific know-how, analytics capability, in-depth industry domain knowledge and commercial IT skills are an ideal base from which to bridge the gap between the Big Data hype and practical analytics delivery. For more content and information on our analytics services and how to beat the Big Data backlash, go to <http://tessella.com>.

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