Enabling the data-driven organisation

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Introduction

"All decisions are supported to the fullest extent possible by the relevant facts"

There are companies such as Google for whom data is the real life-blood of their business – the fundamental currency in which they deal. However, the term is much broader than that, encompassing all businesses that endeavour to put hard data, rather than just 'instinct' or 'gut feel' at the heart of their decision-making.

There is nothing wrong with using intuition and experience to guide decisions, particularly in the context of uncertainty about how customers or competitors will respond – the future is unknowable, after all! However, the truly data-driven organisation ensures that all decisions are supported to the fullest extent possible by the relevant facts.

What, after all, is 'experience' if not our own personal synthesis of what we have observed in the past?

Impediments to impartial decision-making

The human brain is a remarkable tool – capable of analysing data and rapidly spotting patterns to help guide future decisions.

However, it has evolved for a very specific purpose – that of enabling us to survive, not to sell more widgets – and suffers from a number of flaws of which we should be aware.

One of these is a tendency to see patterns where none exist – useful for keeping out of danger where a shifting shape in the grass could represent a lurking predator, but less useful when trying to predict the way a market will develop.

In cognitive psychology, this is known as the '**clustering illusion**' – a tendency to consider random clusters or patterns as significant – and can, if not moderated by hard data, lead to flawed decisions. Other well-known cognitive biases that impede our ability to take impartial business decisions include:

- **Confirmation bias** – the tendency to place more weight on observations that confirm a previous perception

- **Recency bias** – a tendency to rely more heavily on recent experiences than older ones

- **Groupthink** (or the bandwagon effect) – a tendency to believe things because many others do

- **Sampling bias** – our brain can only work with the particular set of experiences that it has had

Marketing departments exploit these and other well-documented human foibles to good effect when trying to sell more products. However, we should be aware of the weaknesses, as well as the undoubted strengths, of the human brain when taking decisions and maintain a healthy scepticism about our own ability to be right all the time.

Our definition of the data-driven organisation is one:

"where everyone who has to take a decision as part of their job has access to the data and tools to enable them to make the best possible choice."

This is a fairly narrow definition and falls some way short of describing companies like Amazon that use their data in increasingly creative ways to sell more products. However, it is a useful and practical definition and one which a number of substantial companies fall short of achieving.

In the following section, we shall examine some of the prerequisites of being a successful data-driven organisation.

Following that, we outline some common scenarios or pitfalls that we have encountered in organisations with which we have worked. Finally, we suggest a set of practical steps toward improving your business's use of data.

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Prerequisites of a data-driven organisation

There are four key issues to be considered by the organisation wishing to be more data-driven:

- **Data availability**
- **Data quality**
- **Quality of tools**
- **User buy-in**

Data availability

This means, in the broadest sense, that people needing data on which to base decisions have access to what they require.

In the data-driven organisation, data is like the oil in an engine – that microscopic layer that means the difference between thousands of miles of trouble-free driving and instant and catastrophic engine failure. Like oil in an engine, data needs to be able to flow freely to everywhere that it is needed.

This means examining systems and processes:

- Is there a channel to everywhere it is needed?

- Are there any blockages in those channels?

- Are there any minor impediments to easy flow?

An example of a missing channel could be where, for example a company IT department restricts access to data systems, rather than adopting a policy that everything should be available to everyone unless it needs to be restricted.

Blockages occur when someone should have access to the data, but for some reason they can't access it. This could be due to training issues or technical problems which mean that for practical purposes, the data that should be available to someone is not.

Under the minor impediments heading we would include problems with timeliness or completeness of the data, or problems with the delivery tools that mean that only certain numbers or reports can easily be generated.

Data quality

This is a huge topic and encompasses many different issues. However broadly speaking this is not primarily about 'wrong data'. It is true that the old maxim of 'garbage in – garbage out' is even more relevant in this age of increasing data reliance, and some of your data will undoubtably be wrong.

The bigger problem by far, though, is not incorrect data but inconsistent or incompatible data due to perfectly valid differences in approach or purpose and sloppy use of language. This is particularly pertinent as an organisation becomes more data-driven and starts to share more of its data between departments and markets.

Take, for example, the term 'revenue' as applied to a particular time period.

The term seems innocuous enough, but on closer examination it is capable of any one of a multitude of different interpretations, depending on the purpose for which it has been collected:

- Do we mean net or gross of discounts? If net, do all departments take the same approach to which discounts/ rebates should be netted off revenue, rather than being treated as a cost?

- Net or gross of VAT/sales taxes?

- Are we referring to the value of goods ordered, invoiced or despatched in the specified period? Or are we talking about cash actually received? All of these numbers can be different.

- How about refunds? Are they taken out of revenue or as a cost? Are they applied to the period in which the refund was paid, or retrospectively back to the order that was refunded?

- Customer sales (EPOS) or warehouse withdrawals or ex-factory sales?

- How are errors handled? Is revenue adjusted retrospectively or not?

- What currency are the numbers expressed in? If converted from a foreign currency, was it converted at the rate prevailing at the time or some other rate?

The point is that none of these different approaches is incorrect, and there are perfectly valid reasons why a particular department or sales organisation might wish to quote revenue (or other measures) on a particular basis which meets their needs.

For as long as the data was not shared outside that department or market, that did not cause any problems – everyone understood what 'revenue' meant and there was no need for clarification.

For example, a Finance department typically deals in hard cash and would not dream of recognising revenue until it has been invoiced, as their numbers have to tie in with the company accounts which are typically prepared on that basis.

Marketing or Sales, however, deal in customer behaviour and are interested in what they have sold. Therefore, they might wish to record the ordered revenue as soon as the order has been placed. If there is a significant lag before invoicing, their measure of revenue will thus be different from, and allocated to a different time period from, that of Finance.

Cancelled orders in the marketing world will adjust the revenue retrospectively, whereas for finance any refunds will show when issued.

So, although none of these different approaches to revenue is necessarily 'wrong', it is a huge source of confusion, and can lead to all sorts of problems down the line if it is not addressed early on. It is practically impossible to run a company if you cannot get a single consistent view on a number as basic as your revenue.

And, although the numbers may not be 'wrong' in themselves, they can lead to bad decisions if the observer is not clear about what they are saying. Using one measure and thinking it is a different one, calculating derived measures from two base measures that are not calculated in the same way, or comparing two measures (budget and actual, say) that are not trying to report the same thing: these are all sources of genuine bad decision-making.

The key conclusion here is that many 'data quality' issues in organisations of a reasonable size are not really about bad data, so much as inconsistent data due to differences in approach. The best way to address these sorts of issues is to apply clarity of thought and a fair deal of painstaking hard work to identify problems and come up with solutions. Simply adopting a clear and consistent approach to naming measures in all tools and reports will address a good 50% of potential problems.

Having said that, there will undoubtedly be some issues to do with 'dirty' data in your organisation. The chief culprits are:

- Free text entry for data that should really be from a choice list

- Systems that allow manual alteration of data in the raw tables, breaking the design

- The lack of a single version of master reference data, such as product attributes

- Information which people were required to enter, but which was never used in the past. There would have been no motivation to get the inputs right.

Again, the solution to these problems lies more with careful analysis than clever programming. Once the problems and their causes have been identified, the solution is often relatively straightforward – although back-populating data that has been incorrect for years can be difficult, or impossible.

Quality of tools

We should assume that availability of data implies some sort of a delivery mechanism. However, the flexibility and ease of use of that delivery mechanism can have a big impact on the amount of value that an organisation can derive from its data.

There are three main types of tools to consider:

- **Reporting** – the ability to get at the numbers quickly and easily. Should be powerful, flexible and fast.

- **Visualisation** – it is true that a picture 'paints a thousand words'. Although a straightforward tabular report might be fine for standard weekly reporting, a graph is much the best way of quickly identifying trends, making patterns stand out, or for clearing out random noise in the data.

- **Analytical tools** – not for everyone, but companies have much more data available than the human brain can readily comprehend. A good graphical visualisation tool can help people to understand the numbers, but powerful statistical techniques can uncover hidden patterns and turn thousands of data points into a small number of actionable facts.

It is not the goal of this paper to promote specific technologies, platforms or reporting tools. However, in the truly data-driven organisation, we believe that every decision-maker should have access to the data and reporting tools that they need to perform their job effectively.

Everyone with any kind of a strategic or planning role needs access to some sort of a visualisation tool, and the business needs a number of experts with specialised analytical tools and skills to enable them to make sense of the huge quantities of data being generated every day.

User buy-in

Finally it is essential not to neglect the importance of user buy-in – a fundamental and often neglected part of becoming truly data-driven.

You can provide your employees with high-quality data and good quality tools, but if they fundamentally believe that their own experience is of greater value, they will not pay them more than lip service.

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Common barriers to the data-driven organisation

In our work with businesses, both large and small, we have encountered a number of recurring situations that impede the free flow of information around the organisation. We have characterised these in the following list of problems, which may well strike a chord:

- **The silo problem**. Data tends to live in silos within the organisation – typically within certain departments or systems. Finance has finance data, marketing has marketing data, operations have operational data and no-one has the complete picture. Departments are unwilling to share their data and are reluctant to trust other people's data.

- **The gatekeeper problem.** Even within a department, access to data (beyond the standard weekly sales reports etc.) has to go through a certain individual or team who have the necessary access rights, tools or skills. This approach will always be a bottleneck to the data-driven organisation.

- **The Excel problem.** Excel is a fantastic tool for analysis, but not good as a repository of key company data, particularly if it needs to be shared.

- **The IT problem.** Data is seen as an 'IT' issue, rather than as a business resource. This can manifest itself as IT feeling they own the data and restricting access, or as other departments not taking ownership of or responsibility for their own data.

- **The parallel universes problem.** Marketing, finance, supply chain and customer services all make their own projections of future sales. None trusts the projections of the other departments so each use their own. This results in the company operating in a series of parallel universes which all represent one possible version of the future.

- **The Promised Land problem.** There are plans in the pipeline to implement an all-singing, all-dancing new data warehouse as part of, say, a roll out of SAP or Business Objects etc. Typically this has a very grandiose title such as 'Project Krypton'. The stock response to data problems is 'Just wait – it will be OK once Project Krypton comes along'. The truth is that software is very rarely the solution to anything on its own.

  These grand projects very rarely deliver as much or as quickly as they are expected to and, to the extent that they do deliver, it is because the project team has done the hard work of identifying and addressing the sorts of data issues highlighted above. That means that they are rarely a good reason not to address data problems now – any work done should benefit the project.

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Enabling the data-driven organisation – a blueprint

So, what sorts of attributes tend to characterise the data-driven organisation? What steps can organisations take to become truly data-driven?

- **Top management involvement.** First and foremost, this is a cultural change that has to be driven from the top. Otherwise any initiatives will be piecemeal and half-hearted and people will feel justified in ignoring them.

- **A principle of openness.** Rather than adopting an approach of only allowing access to certain data and systems, the principle should be that everyone has access to everything unless there are reasons to restrict them. By all means take steps to prevent access by, for example, contractors working on-site, but employees should have as wide access to business data as possible. That way, they will feel engaged, and the business should benefit from having more eyeballs and brains looking at its data.

- **High-level ownership.** Someone should have overall responsibility for the availability of data and tools within the business: someone whose job it is to care when the numbers are wrong or inconsistent, and who has the clout to sort it out.

- **A business, not an IT resource.** Business data is a hugely valuable resource that belongs to the business as a whole. Treating it as a purely IT issue, simply because it is stored in computers, is like delegating responsibility for the company's finances to the bank that holds the bank account.

- **Excel is a spreadsheet, not a database.** Don't rely on Excel as your primary planning or reporting tool. It is great for crunching numbers, trying out 'what-if' scenarios and even creating reports. However, if you want everyone in the business to be working off the same data, you need a database.

- **Don't rely on computers.** On the other hand, don't imagine that simply installing another computer system is the answer. Most companies have more than enough databases and reporting tools and installing yet another one is unlikely to solve any problems in itself.

  Data-enabling an organisation is 90% cultural change and hard work, and 10% about what systems you have. Before investing a lot in a new computer system, be sure you understand why your current systems could not be adapted to display all the data you need, and what specifically the new system is bringing that is not available to you now.

- **Keep at it!** All new systems and cultural changes encounter resistance and have teething problems. Any project to bring the company's data together and make it available will have its share of difficulties and sceptics. There will be people who say the numbers are 'wrong' or, more vaguely, that they 'don't trust' the numbers in the system.

  As part of the cultural transformation required to become a data-driven organisation, this sort of language must be considered unacceptable. If numbers are wrong, they must be fixed; if right, people must use them. The company is investing time and money in making data available, and it cannot tolerate vague talk of 'problems' with the data.

Above all, our conclusion is that enabling the data-driven organisation is primarily a business, not an IT task. It really is not rocket science – the biggest hurdles are generally cultural, rather than technical.

In these days of powerful databases, cheap storage and ubiquitous networking, it is time for businesses to reclaim their data and insist on universal access.

Then all businesses can be truly data-driven.

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About Golden Orb

Golden Orb is a UK-based management consultancy specialising in using computer technology to solve complex business problems.

Our main business is undertaking data analysis and developing bespoke business software for analytical and modelling applications. Industries served in recent years include FMCG, Direct Marketing, Financial Services, Healthcare and Consumer Electronics but our techniques are applicable across a wide range of industries and functions.

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To find out more, please get in contact with Terry Hogan on 01784 818 049 or email enquiries@golden-orb.ltd.uk.

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