



CREATING BREAKTHROUGH OPPORTUNITIES WITH AMBIENT INTELLIGENCE

How to optimise the big data
value chain

DATA CREATES VALUE FOR ORGANISATIONS

Although much talked about in recent years, the application of data to drive value in business is not new. Over one hundred years ago, a data pioneer by the name of Frederick Hoffman visited graveyards in South Carolina writing down the birth and death dates on every gravestone. Why? His mission was to gather the data that proved life insurance could be a profitable business in the Southern states – a region previously written off by the insurance companies based in the North. This is a great early example of how big data can enable breakthrough innovation. More recently, we have seen airlines use data to dynamically price tickets, Amazon use data to personalise recommended products and Tesco develop a data-driven loyalty card scheme that revolutionised the grocery sector. So what has changed to make big data such a hot topic now?

We have seen three significant trends in data over recent years: first, the amount of data available has increased exponentially, and continues to grow at a breakneck speed. Second, the nature of the data has changed – it is now possible to understand what consumers really feel about products and services, and what matters most to them in their lives. Third, thanks to the cloud enabling greater accessibility and scalability of data, this data can be analysed in real time. The culmination of these trends has resulted in huge disruptions: small well-run hotels have gained market share thanks to TripAdvisor, safe drivers can receive discounts on their car insurance thanks to telematics devices, and savvy politicians can target swing voters and win 'unwinnable' elections. Critically, it is not sufficient to simply access data – these examples prove that data must be applied effectively.



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AMBIENT INTELLIGENCE

Our definition of Ambient Intelligence is what organisations get when they collect, understand and use data that is immediate and ubiquitous. This data is gathered from many sources, both static and mobile, and is speedily processed in order to make better decisions.

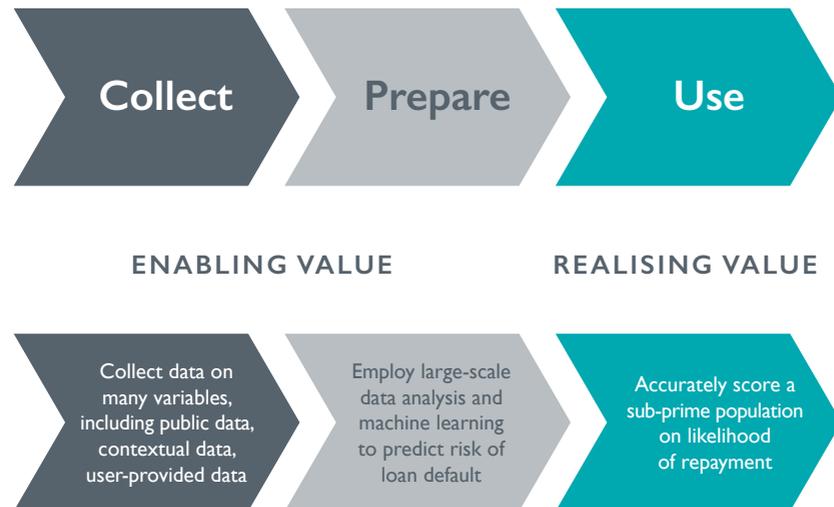
Savvy companies are using Ambient Intelligence to rapidly react to changing needs and opportunities. Experimentation and constant feedback allow these companies to learn quickly what the market needs and to deliver targeted responses. These companies know their consumers better, and make customised offerings to carefully defined consumer segments. They develop and deploy new business models based on the utilisation of data, creating new products and services that meet clearly defined needs. Perhaps most usefully of all, they replace guesswork with decision-making algorithms, ensuring operational efficiency and avoiding bias and blinkered thinking.

Given the success stories and the opportunities involving Ambient Intelligence, it is at first surprising that so many companies are not making the most of it. One reason is that it is not always easy to spot the breakthrough opportunities that data can enable. More importantly, there is growing public awareness of and resistance to misuse of data by private companies. Many organisations have had their fingers burnt when attempting to monetise data – consider the negative reaction when Amazon suggested using data to increase the price offered to certain consumer segments. Increasingly, consumers are developing strategies to prevent companies from exploiting their data, such as searching for flights in Internet cafes to avoid airlines increasing the prices they see on the second or third search.

Many companies and organisations have contributed to the erosion of trust related to misuse of consumer data, from social media sites selling your data to third parties, to governments appearing to spy on their citizens. Despite this, it is not the case that consumers are unwilling to share their data in all circumstances. They just need to be reassured that they, as well as large companies, will benefit from sharing their data. In other words, if you want to motivate sharing of data, some value should be created at every point along the data value chain.

A MODEL OF AMBIENT INTELLIGENCE

At its simplest, the Ambient Intelligence value chain can be modelled in three stages (see diagram below).



Zest Finance **collects** data on loan applicants, **prepares** their data, and **uses** it to determine good candidates for loans.

To understand the model, let's consider a simple example. Zest Finance has used data to revolutionise the provision of loans to people who are ignored by traditional lenders. Zest Finance does not accept a higher level of risk. Instead, it uses broader and richer data sources to create a detailed picture of its potential creditors, offering loans to those it considers a safe bet.

The data that Zest Finance relies on comes from a range of sources, from the traditional (like income and expenditure) to highly contextualised data (mobile phone subscriptions, for example, or even how long a user spends browsing the Zest Finance website). Where Zest Finance really excels is in its ability to prepare and process the data it has gathered. Drawing on cutting edge machine learning technology, as well as traditional algorithms and statistical models, Zest Finance is able to process high volumes of data, and draw from this data set the key insights that allow it to identify good candidates for loans. Value is generated from this data set through traditional financial business models, by making loans and collecting interest payments.

CREATING THE AMBIENT INTELLIGENCE VALUE CHAIN

As the Zest Finance example shows, rich and broad data sets can create significant value. However, most businesses do not directly own the ability to collect all the data they need to make the most of Ambient Intelligence. Instead, it may be necessary to collaborate with users, consumers, other businesses, public bodies, governments, and others in order to access the required data. Clearly, all the stakeholders in any data collaboration must be motivated to share their data.

Key to motivating stakeholders to share their data is the recognition that the flow of data forms a value chain. As with any value chain in any industry, every player must generate value from participating in the value chain. In every value chain, a key barrier to overcome for every stakeholder is the cost (in time or resources) to the individual player associated with creating value along the entire chain – we all want to avoid personal losses for the gain of others. What is unique about Ambient Intelligence is that the consumer is often the source of the data of interest. In this case, the consumer's understandable fear of losing out by sharing data has been exacerbated by media reports of the misuse of personal data by private organisations and governments.

Clearly there are barriers to data sharing that must be overcome in order to unlock the opportunities provided by Ambient Intelligence. Innovia has identified five key insights:

- 1. Align user and organisational needs**
- 2. Solve a real user problem to add value**
- 3. Reward those who provide the data**
- 4. Measure value holistically**
- 5. Think beyond the conventional company framework**

1. Align user and organisational needs

The ideal situation is a win-win, which occurs when both the consumer and the organisation benefit from sharing data. Therefore, there must be compelling value propositions for both the consumer and the organisation.

The Oyster card system is a good example of a system that has aligned user and organisational needs. Previously the system relied on paper tickets that were slow and cumbersome – switching to the new technology greatly improved the flow of people through ticket barriers. To incentivise use of the technology, Transport for London offered reduced fares for those using the Oyster card. The system has now run successfully for 12 years, with more than 85% of all bus and rail journeys in London now paid for using the system.

The Oyster card transport system has been an unequivocal success for customer convenience, and has generated enormous amounts of data which are used to inform transport strategy, which goes on to benefit the customers – a closed Ambient Intelligence loop.

2. Solve a real user problem to add value

Meeting clearly defined consumer needs will always add value. Solving problems that consumers care about will make them far more motivated to share relevant data. It is often the case for Ambient Intelligence that spotting the opportunities to add value requires breakthrough innovation, since these opportunities are typically very different from what has gone before.

Ford created a crowd-sourced database called Parking Spotter to provide real time information about free parking spots to drivers of its cars. In return for the convenience of finding a parking space, Ford's drivers provided it with valuable data to create new and targeted sales propositions.

3. Reward those who provide the data

Walmart is the world's largest retailer. They started to consider the use of predictive analytics in 2004 when looking at retail trends that occurred before Hurricane Charley. They noticed a predicted increase in torches and emergency equipment and an unpredicted increase in beer and strawberry Pop-Tarts – an insight that influenced stocking decisions. Walmart has since set up @WalmartLabs, which aims to find pioneering uses for data in retail.

Some of these new data uses include guessing the likelihood of an individual purchasing an item based on their conversations with friends on social networks, suggesting gifts for an individual's friends based on the friend's social network habits, and crowdsourcing new products by allowing the public to vote on whether they should be stocked by Walmart. In addition, items in store can be scanned for reviews and navigation apps within the stores steer customers through the shop to the products that they need. Solving customers' problems through the use of Ambient Intelligence has generated substantial value for Walmart.

4. Measure value holistically

Often the value generated by Ambient Intelligence does not immediately convert into increased revenues for companies. Building relationships with consumers based on deeper loyalty may be harder to quantify, but will generate returns over a far longer timescale.

Google has proved many times that it can monetise data by focusing on the things that consumers care about. Often it invests in new technologies and platforms without there being a clear revenue stream associated with these in the short term. One example is the Google Traffic platform, which collects data about the locations of mobile phone users and superimposes them onto its maps, thus identifying areas of high congestion or free-flowing traffic. Whilst it is not yet clear how Google will monetise this platform, it has many opportunities to do so, from selling data to town planners, through to improving navigation for its own self-driving cars.

5. Think beyond the conventional company framework

Typically companies see data as an asset that must be protected in order to be monetised. However, some of the most compelling examples of Ambient Intelligence have been made possible when companies share their data to allow others to collaborate in value creation.

An interesting example is Strava – a social platform for athletes that enables them to track their performance via GPS. Strava realised that the data provided by cyclists could provide very useful insights to improve cycling provision, and thus began selling this data to town planners – a big departure from its original business model. The cyclists sharing the data also benefited from improved infrastructure targeted to their needs.

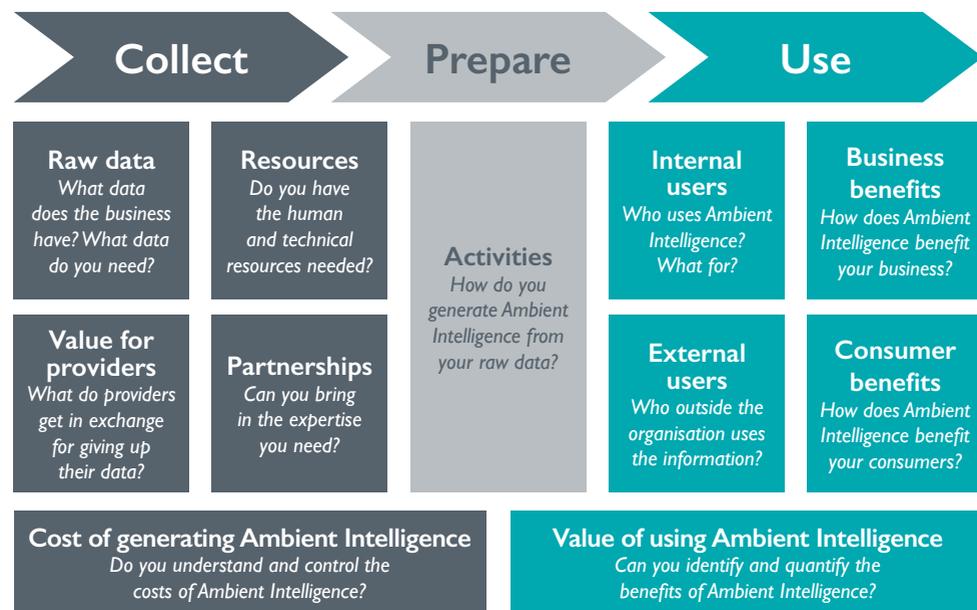


BRINGING THE THINKING TOGETHER – THE AMBIENT INTELLIGENCE VALUE CHAIN CANVAS

We have already identified that, to make the most of Ambient Intelligence, companies need to:

1. **Recognise the opportunities that Ambient Intelligence can unlock,**
2. **Identify the data required to generate the Ambient Intelligence, and**
3. **Create a value chain that motivates the originators of that data to make it available.**

The Ambient Intelligence Canvas helps companies with all three of these challenges.



Use the Ambient Intelligence Value Chain Canvas as a creative tool or as a pragmatic planning tool. To find out more, contact Innovia on: ambientintelligence@innoviatech.com

First, the full version (with additional probing questions) of the Ambient Intelligence Canvas can be used as an assessment tool to help companies assess their overall use of Ambient Intelligence, spot gaps and opportunities, and where required, identify the key barriers they face to successfully utilising Ambient Intelligence. The barriers are probably unique to the organisation, but may include issues such as gaps in the resources or capabilities to collect data, a lack of a clear strategy to prepare and process the data or no simple and easily shared vision of the value that will be created for the company and its consumers.

Second, the Ambient Intelligence Canvas can be used as a creative tool to broadly explore opportunities for breakthrough innovation enabled by Ambient Intelligence. Often these opportunities will be very different from what is currently offered, and the tool can help people see beyond limiting assumptions, and reach for very different thinking. The Ambient Intelligence Canvas also allows companies to define a specific value-generating proposition for consumers, and then identify all the resources, (such as data, technologies, relationships) required to develop and deliver that proposition. When thinking towards the future, companies can use the Ambient Intelligence Canvas for strategic planning, to identify the capabilities and resources they should invest in to fully exploit Ambient Intelligence.

Third, the Ambient Intelligence Canvas can be used as an alignment tool, guiding the discussions required both internally, and with external stakeholders, to align incentives across the value chain, and work towards realising the latent value contained in Ambient Intelligence. In most cases, successful Ambient Intelligence business models fulfil between three and five of the insights identified to create value for all stakeholders in the value chain. To be successful, companies should avoid making the perfect the enemy of the good. The Ambient Intelligence Canvas can be used to determine what isn't needed to make the business model successful, thus simplifying execution and delivery of the model, and allowing opportunities to be realised more quickly.

Finally, the Ambient Intelligence Canvas can be a useful tool for drawing lessons from successful (and unsuccessful) big data case studies.

THE COMPANIES THAT GENERATE SUSTAINED COMPETITIVE ADVANTAGE IN THE FUTURE WILL DO SO BY CONSTRUCTING AND UTILISING COHESIVE DATA VALUE CHAINS

Now that the tremendous value potential in rich and broad data sets is understood, it is clear that companies need to engage in the full data value chain in order to compete. It is no longer sufficient to rely on fully owned, proprietary data and technological capabilities to create value from data. The winning value chains are those that align incentives across all stakeholders and the winning companies are those that can clearly link data collection, manipulation and decision-making to business goals and value-generating propositions.



MAKE IT HAPPEN



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