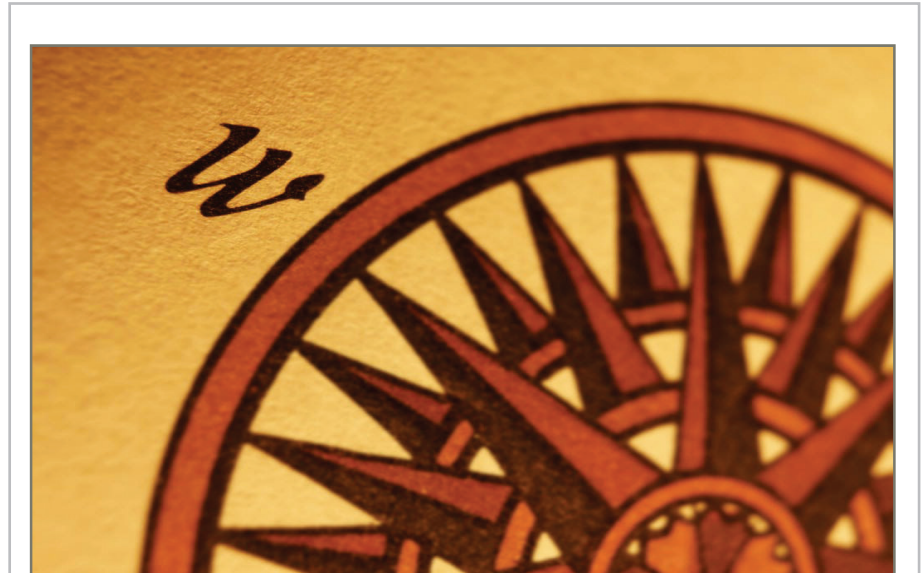


“We tried enterprise architecture but it didn’t work. All we got were lots of diagrams.”

Most enterprise architects will have heard a statement like this at one time or another. It’s sometimes justified. A project that succeeds in producing reams of diagrams with no other noticeable effect is enough to turn anyone into a sceptic about the value of enterprise architecture (EA). The architect’s reply is likely to be on the lines of: “But enterprise architecture’s not about drawing diagrams – it’s about changing the enterprise!”.

That’s as may be, but the fact remains that enterprise architects unquestionably spend a lot of time presenting, writing and talking about diagrams. For an architect they are a means to an end – an end that can only be realised if the diagrams accurately represent the relevant features of the enterprise and the intended users can correctly interpret the information they contain. Only then is there a firm foundation for action.

Now, for our hypothetical EA sceptic, the diagrams clearly didn’t have the desired effect. Assuming that there was a real vision for change and a mandate to execute it, backed up by the resources and commitment to carry it through, the diagrams themselves may have



“... Murat was incomparable on the field of battle ... and still he was a poor general. He always waged war without maps, and how many mistakes did he not commit ...”

Napoleon, quoted in “Napoleon on the Art of War”,
Jay Luvaas, The Free Press, 2001

been at least part of the problem¹. So we might reasonably ask: Who were the diagrams for? Were they intended to be read by architects? By business people? Or were diagrams the best way to conduct communication in the first place?

The product of enterprise architecture - a representation of an enterprise in an existing or proposed state - is often compared to a map. Many undertakings depend

on maps, and some inevitably fail. If inaccurate or inappropriate maps are a factor, there may be a call for better maps, but the whole discipline of cartography – the art and science of map-making – isn’t dismissed as a waste of time. On the contrary, the value of maps seems to be universally recognised in a way that just isn’t true for EA. That being the case, can enterprise architects learn anything from map-makers?

1. “In presentations we have railed against traditional IT architecture efforts for their remoteness from the reality of the business and their heavy reliance on mind-numbing detail represented in charts that look more like circuit diagrams than business descriptions and that are useful as little more than doorstops.” Robertson et al [1], quoted in “Why Doesn’t the Federal Enterprise Architecture Work?” [2]

Maps and Enterprise Architecture

Enterprise architecture has been around for a couple of decades. Not everyone “gets” it. Maps have been used for at least a couple of millennia. People don’t just “get” maps - they can’t get enough of them. More specifically, what people want is access to map data in a handy, accessible and targeted form. Travellers plan journeys using applications like Google Maps™. Motorists routinely rely on sat-navs. Even the market for vehicle sat-navs is being overtaken by Personal Navigational Devices (PND) and smartphone applications that give users access to localised information about their environment wherever they are. Today, the delivery of map-based content provides millions of people with a way to augment their experience of their surroundings.

There are strong similarities between the graphical communication concepts used in map-making and enterprise architecture. There are also several parallels in the development of some of the technologies applied to them. Let’s take a look at some of those similarities. For convenience, we’ll split the development into three stages: (1) Maps as Pictures, (2) Map modelling revolution, (3) Contextualised delivery of content.

Maps as Pictures

Everyone is familiar with the concept of a map as a picture that shows natural and human fea-

tures that exist (or could exist) on an area of the earth’s surface. Of course, it’s a highly-stylised picture, using symbols with specific meanings to represent the features. The symbols have their own rules that govern the ways they can be used. For example, contour lines mustn’t cross each other. To do so would be to represent a situation that has no meaning in the real world.

Early printed maps were painstakingly engraved by hand. Map-makers had to be very selective about which details to show, because too much detail would make the map unreadable. Multiple maps of the same area could be made in order to show different aspects of interest, such as physical features or political boundaries. However, this had to be done with great care to avoid inconsistencies. The only way to check the content of the map was by careful examination.

Diagrams are commonly used in enterprise architectures to capture and communicate information. Distinct types of map can be created to show different information about the same area. Similarly, many types of diagram are used to show different aspects (or “**views**”) of the same enterprise: organisation charts, process sequence diagrams, computer network diagrams etc. Diagrams are constructed in accordance with particular notations. Each notation defines a set of symbols intended to represent features of the enterprise. Like map symbols, they have specific meanings and rules that govern their use.

However, diagrams created with pen and paper, or using general-purpose computerised drawing applications, have the same problem as simple paper maps: the symbols that represent real-world concepts aren’t defined and recorded in a way that can be automatically queried. This makes it very hard to maintain consistency (a) within the diagrams themselves (b) between different diagrams and (c) with any accompanying text descriptions. The only way to check the diagrams for consistency and correctness is by manual inspection. This is impractical for architectures that may include hundreds or even thousands of individual diagrams.

Map Modelling Revolution

Mapmaking was revolutionised in the 1960’s by the introduction of digital technology in the form of Geographical Information Systems (GIS). Instead of storing map information in the form of inert images, map data was recorded in database that structured the data in the form of a **model** made up of **objects** and **relationships**. This made it possible to query the model to find out useful information, such as the distance between two towns in a road network.

Specialised EA tools have had a similar effect on enterprise architecture. Maps are primarily concerned with the spatial location of objects. Architectures are concerned with the dependencies between objects. EA tools record processes, organisational units, ap-

plications etc. as objects related to each other in a model, as opposed to a simple picture. This makes it possible to perform analyses based on those objects and their relationships in the same way that a GIS enables analysis of map content.

For example, it is possible to run a report that shows all the applications currently used by a particular department to perform its processes. Another report might list the individual application functions actually required by each process. This can help to identify potential cost savings by showing where the organisation is using multiple applications that have redundant functionality.

Contextualised Delivery of Content

So far we have highlighted the parallels between the techniques and tools used by map-makers and enterprise architects. So why are mapping applications so wildly popular as to be indispensable, while EA has some way to go to catch up?

Modern mobile GIS applications deliver map data right to the user's portable device. Not only that, map technology has moved beyond providing users just with particular pre-defined types of map. The user's location, needs and preferences are combined

with map data to deliver a personalised map experience. Conventional maps show a bird's eye view of the landscape that require users to orient the map to their surroundings, and then to select and interpret features of interest to them. The information in a conventional map is chosen and presented in a way that is outside the user's control.

In contrast, according to Tomasz Zarycki [3], the effect of modern GIS applications is to enable users to dynamically define their own maps in real-time, in a way that responds to the users' needs at that moment. Every user can have a map that places the user at the centre and shows the world from the user's own point of view. In any location, the user can be presented with information that is of specific interest to him or her. For example, mobile mapping apps can enable details of restaurants, hotels, events, or even friends who happen to be in the area, to be displayed at will.

Syntax and Semantics vs. Pragmatics

Cartographers have always given a lot of consideration to the best ways of communicating with map users. Traditionally, map-makers expended enormous effort on capturing accurate data and try-

ing to depict it in a rigorous way that was meaningful both to map **makers** and map **users**. They concerned themselves with the **semantics** and **syntax** of the map i.e. the meaning of the map symbols and the formal properties of those symbols. Now, with the advent of GIS, map-makers increasingly concern themselves with **pragmatics** – the study of the ways in which context contributes to meaning¹.

Zarycki contrasts the two approaches:

“ [In Zarycki's] map semantics approach, ‘maps are created by a cartographer on the basis of his/her knowledge about reality’. In the map pragmatic approach ‘maps are designed not only by those who make them but also by the interests of those whom they serve. The map appears to be under the direct and indirect influence of the potential or actual users’. ” [4]

Whereas previously the influence of the map-maker was dominant, and the map was fixed, technology makes it possible for users to influence the map at the point of use.

1. “Semantics deals with the meaning of the symbols ... syntax deals with the formal properties of signs and symbols ... and pragmatics deals with all the psychological, biological, and sociological phenomena that surround the functioning of cartographic signs” Fernandez & Buchroithner [4]

A car sat-nav user requires no special training in the use of maps. The driver's context is well-defined. She has a specified destination and route. Her current position and direction is provided by the sat-nav's GPS receiver. The only information needed is the direction to take at the next road junction. This is conveniently communicated by a dynamically-updated schematic display of the road ahead and by voice instructions. The information provided to the driver is reduced to the minimum needed in the context of the task, and is all the more valuable for that.

Instead of being a **one-way** channel of communication between map-maker and user (like a conventional road atlas) the sat-nav is **interactive**. The information it provides is updated according to the user's position and the information requested (e.g. places of interest). The underlying map data used to provide this is essential-

ly exactly the same as that used to produce a road atlas. However, the sat-nav clearly wins out in the driver's context because it provides accurate information in an appropriate and timely way. If the driver wants more, the sat nav can display a range of alternative map views, as well as a host of other information, as required.

Architects might do well to give more consideration to the **pragmatics** of architectural communication. Architects sometimes give the impression that the inability of users to see the value of diagrams is a failure on the user's part to understand what the diagrams show. Instead, might it be that the diagrams don't show those aspects of the enterprise that are important to the user, or show them in a way that only makes sense to a specialist?



Maps aren't ends in themselves. It is the interplay between map, user and the real world that enables the right course to be taken.

Changing the Focus of Enterprise Architecture

Are There any Lessons Here for Enterprise Architects?

Well, EA practitioners tend to spend a lot of time concerning themselves with the **syntax** and **semantics** of architecture diagrams. This is important and is necessary to ensure that the **producers** of the architecture create rigorous, accurate and consistent models of the enterprise. However, the syntax and semantics of

models are rarely of interest to the **consumers** of the architecture.

Meteorologists use a worldwide network of weather stations and powerful supercomputers to generate detailed weather maps. Weather forecasts are important to many people, but no-one, least of all the weather forecasters, expects the general public to be able to interpret the maps in their raw state. They know that most users don't want to read a pattern of isobars; they want to know if it will be sunny tomorrow.

The New Role of Stakeholders

Stakeholders have information needs based on the roles they perform in the enterprise. Role-specific views, created in consultation with the stakeholder, are more likely to result in users gaining value from the architecture.

A little more time spent listening to users to find out exactly what they do and what information they need, might result in better architectures and happier customers. Developers of applications that use map data are constantly on the lookout for information that might be important to potential consumers, in order to provide new and creative ways of making map data useful to them. Perhaps one lesson we should learn from them is that the value of enterprise architecture will become more apparent to a wider audience only if architecture practitioners, methodologists and tool vendors endeavour to do the same.

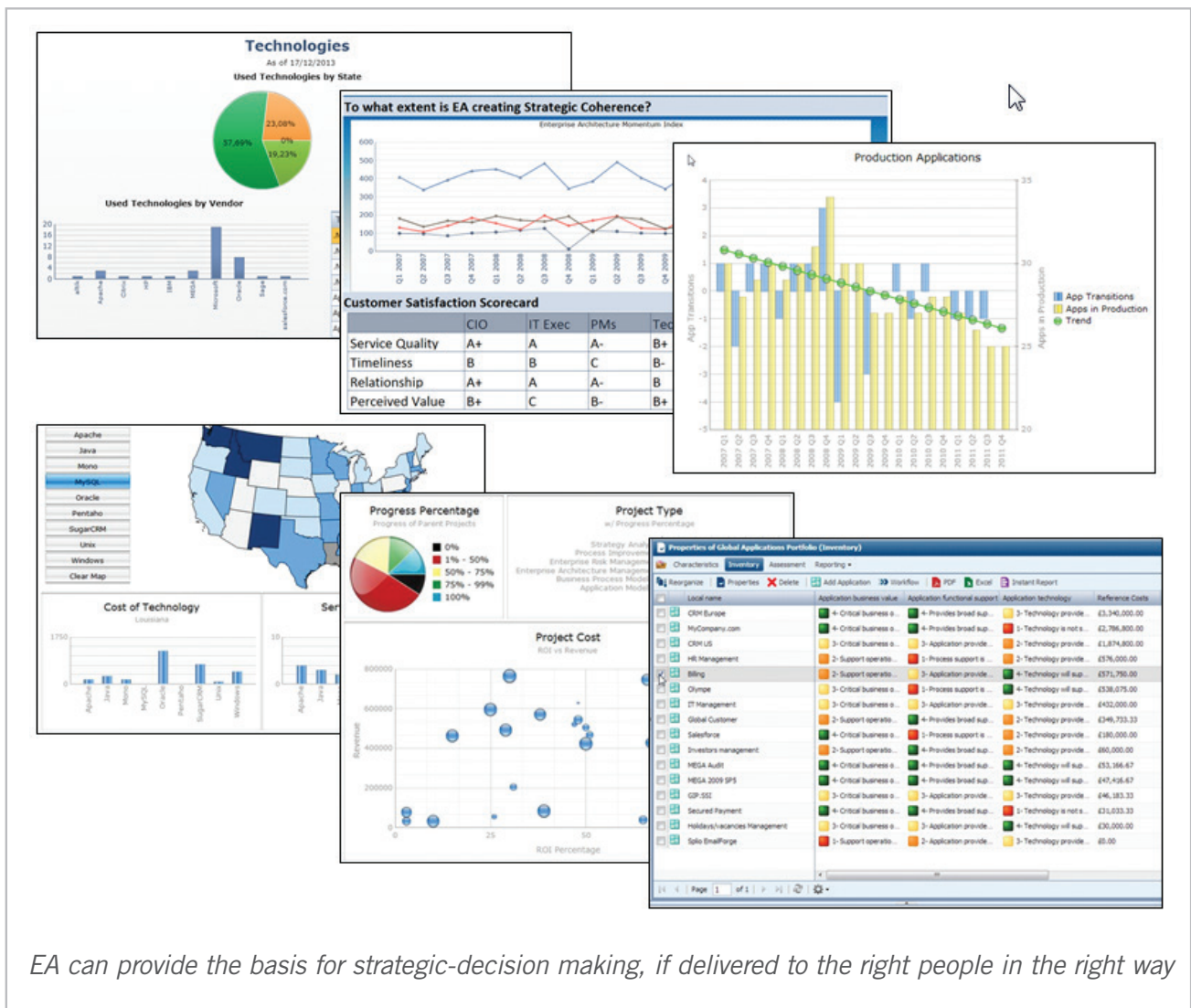
For their part, potential stakeholders need to be made aware that they are active participants in the architecture process. If a particular view isn't going to work for them, they need to be encouraged to say what will.

New Generation Enterprise Architecture Tools

Just as in the case of map technology, modern enterprise architecture tools can now give users much more control over the way they consume EA content. Like

maps, enterprise architectures can be enriched with information that is valuable to specific users. Modern tools can do this without compromising the usability or integrity of the overall architecture. For example, indicators can be associated with architecture objects to show objectives, requirements,

risks, mitigating measures, quality metrics and so on. Tool features that can define customer-specific views, and that enable additional detail to be dynamically displayed (or hidden) on demand, are examples of ways that content can be contextualised for users.



EA can provide the basis for strategic-decision making, if delivered to the right people in the right way

Like weather maps, EA diagrams capture what we know about the system but they don't have to be the primary mechanism for communicating that information. Flexible reporting facilities that can render selected content in a vari-

ety of formats on request help the user to interpret and interact with the content according to their current needs. Some tools also enable dynamic update of the architecture via a user-oriented report interface. These make it easier for

users to become active contributors to the architecture. The important thing is that consumers of architecture content are given access to it on terms that are meaningful to **them**, in the context of **their** situation and concerns.

Right Information, Right People, Right Way

We have to be careful in applying analogies. Enterprise architects might argue that cartographers have a relatively easy task. Map-makers at least have an objective reality, in the form of the physical terrain, to measure and describe. They can apply scientific methods and instruments to measure that physical reality with a high degree of precision. Architects, on the other hand, must try to create a consensual representation of a system based on information provided by many stakeholders with partial knowledge and different understandings of that system.

However, the cartographers themselves are, in fact, only too aware that many aspects of map-making are far from being objective [5]. The choice of objects to include (or omit), the categories to which the objects are assigned, and the names applied to the objects are all acts that are driven by the intent of the map-maker.

Architects also have to make these choices, taking into account not only their own views but also those of their stakeholders. Unlike a map, an enterprise architecture can only sensibly be constructed with the active participation of its subject matter.

Ultimately, the quality of an architecture depends not only on how accurately it represents the enter-

prise, but on how well stakeholders can understand it and employ it in order to effect changes in the enterprise. That makes it even more important that, like map-makers, enterprise architects constantly strive to find new and more effective ways of interacting with their stakeholders.



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