**Seeing the Big Picture in Services Marketing Research:  
Infographics, SEM and Data Visualisation**

**Introduction**

The activity of writing and publishing papers in learned journals can be regarded as unfulfilling unless somebody actually reads and understands the insights offered. While we do not doubt the sincerity with which papers are written, and appreciate the hours of intellectual toil that academics invest in the hope of advancing theory and thought in their respective fields, we do note a reluctance to make the work palatable to audiences that extend beyond the editor and the three reviewers of the paper. The end game of these ivory tower antics it seems is to get the paper published. It is little wonder then that Lehmann *et als.* (2011 p.155) make the observation that the increasing sophistication of academic analysis *“hinders communication, making any insights associated with the research less accessible to managers as well as to most other academics.”* Such a situation cannot continue indefinitely, especially in a climate in which government and university bodies continually stress that academic marketing research should be more impactful and wide-reaching (HEFCE, 2012). Services marketing academics, loath though some may be to doing so, will recognise that publishing papers and disseminating the knowledge within them is indeed a ‘service’. As service providers, it is encumbant that academics tailor their offering to suit their prospective customers. Simply bolting on a managerial implications section at the end of a paper, however, is not of sufficient worth to ensure a wide and engaged readership. We suggest one way of providing this service, without fundamentally changing the accepted format of journals as we know them, is to augment them by using visual portrayals of research findings - otherwise known as ‘infographics.’

In this paper we demonstrate the process of producing an infographic as a means to enable knowledge transfer between an academic and a wider audience. Artistically crafted infographics can be used to complement the scientific method, facilitating progress and innovation. We argue that infographics can be applied to papers not only in services marketing, but throughout academia. By implementing this fresh thinking, artistic approach, and ultimately viewing research dissemination as a service, the work of academics could become more impactful. In doing so, this article contributes to the nascent body of research on how to effectively disseminate research findings to a broader audience through adopting a *service arts* perspective (Daly *et al.* 2014).

While academic marketing research employs many methodologies, we restrict ourselves, in this instance, to considering the means of disseminating marketing insights derived from structural equation modeling (SEM) studies. According to Hair *et al.* (2011 p139), *“SEM has become a quasi-standard in marketing and management research when it comes to analyzing the cause-effect relations between latent constructs”* and is considered by Steenkamp and Baumgartner (2000 p195) as *“... one of the most popular and well-known advanced approaches used in marketing”*. SEM has relatively clear guidelines for adopting a rigorously, quantitative approach to research (Schumacker and Lomax 2010), but, arguably, this leads to a tendency, in published papers, to let the statistical findings speak for themselves. As the current editor of Journal of Marketing Research observes, *“...there is now too great a separation between marketing academia and practice”* (Meyer, 2013, p.1), and, with reference to quantitative and SEM-based research, *“...if new methods or models are being proposed, it will be insufficient to describe them and report fit statistics”* (Meyer, 2013 p2).

For many potential beneficiaries of the research findings, the arcane nature of SEM research outcomes can prove to be unbridgeable in their quest for understanding, thus lessening the potential for relevance or impact. It is our view that the modeler should attempt to reconcile the position between themselves and the reader, but this is not an easy step to take. However, without the commitment to dissemination, as Meyer (2013) implies, SEM output is insufficient and incomplete. It will lack reach. In this paper, we develop an innovative method for the dissemination of SEM study findings through the provision of infographics by adopting a service arts lens during the final phase of research. This aims to make SEM studies more palatable and impactful to business and the wider academic community.

The paper begins by giving a brief history of the role that infographics have thus far played in communicating information. We then move onto positioning the provision of infographics as a service which delivers in terms of its novelty, informativeness, efficiency and aesthetic value. Next, we offer a discussion on the essence of SEM and the diverse views concerning its value. We then provide an example of how a typical SEM could be re-interpreted using a services art lens to produce an infographic using a six step process. Finally, we reflect on lessons learned from applying this technique as a means to increase the impactfulness of marketing research.

**Introducing Infographics**

The purpose of an infographic can be simply explained via reference to the well-known axiom that ‘a picture is worth a thousand words’. According to Bogost, Ferrari and Schweizer (2010) infographics are visual pieces of information that liberate data from the constraints of the written word. This ‘eye-candied’ information takes data and simplifies it into visuals so that it can be easily communicated to readers. In his book entitled ‘The Visual Display of Quantitative Information’ information pioneer Edward Tufte argues that information design needs a *“clear portrayal of complexity…the task of the designer is to give visual access to the subtle and the difficult – that is, the revelation of the complex”* (Tufte, 1983, p.191).

Infographics have a varied history. Their purpose and execution have changed through time, moving between being serious to compelling, detailed to simple, rational to emotional and formal to stylized (Bogost *et al.* 2010). In this section we provide a brief history of the infographic culminating in discussing its current use within marketing research.

People started telling stories with pictures long before the use of text. This began around 35,000 years ago when people drew pictures on rocks and walls to communicate with each other (Smiciklas, 2012). In more modern history, early infographics have been highly influential in the fields of mathematics, economics and sciences, before later being adopted by mass media. For example, the ‘lady of the lamp’, Florence Nightingale persuaded the Queen Victoria to improve the conditions in hospitals in 1857 using a coxcomb chart (Manghani, 2013). Moreover, in 1820 Carl Ritter, one of the establishers of modern geography, was characterised by his hand drawn ingenious maps including illustrations and sign systems (Gage, 1864).

The infographic as we recognise it today has been espoused as an effective form of visual communication since the turn of the 20th century (Bogost *et al*. 2010). In the 1920’s Otto Neurath pioneered a movement called Isotype, which is an international picture language. Isotype was an early form of infographics, which Neurath championed as having the potential to challenge the utility of the written word. With his background in philosophy, sociology and economics Isotype favoured the rational and formal (Lupton and Miller, 1999). The movement strove to provide visual education, which enhanced verbal language rather than replacing it. Isotype’s emphasis was on helping people to learn about the world around them through the simplification of complex information. Otto Neurath died in 1945 after fleeing Vienna to England during the German invasion, but his wife Marie continued to work with Isotype long after his demise.

After the creation of Isotype, The New York Times began to feature infographics most popularly in the form of maps (Bogost *et al*. 2010). These types of infographics were challenged in the 1930’s when European styles of infographics brought to America by immigrants started to influence the style of infographic regularly shown in the news (Meyer, 1997). Towards the late 1930’s businesses began to take notice and adopt the use of infographics. Around this time *Fortune* magazine published graphical bar charts based on a business survey (Meyer, 1997). However, this was not a full-scale adoption as smaller newspapers and publishing outlets still largely did not adopt the infographic, despite having the capabilities to do so. It wasn’t until the 1950’s and 60’s that creative infographics began to overtake the isotype style popularised by Neurath. During this time a style named ‘Chartoon’ became popular in New York, championed by British born Nigel Holmes, who enjoyed a successful career at Time Magazine for 16 years (Bogost *et al*. 2010). His ‘explanation graphics’ at first met with resistance from editors, but after he gained recognition from readers, they soon came to accept his style. He describes this process in the quote taken from Eye Magazine below (Holmes, 2012):

*“I used my lack of knowledge about how things worked in the US to initiate discussions with the writers. Some of them had a hard time explaining the financial and business concepts they used, but in conversation they often spoke in metaphors, and that led to simple visual ideas that explained what they were talking about.”*

Between the 1960’s and 80’s infographics became a part of the daily news and the contrast between detailed infographics communicating serious ideas, and simple graphics used more to entertain, became apparent through different news outlets. Facilitating this change was information technology (Bogost *et al.* 2010). As computers became more accessible, infographics could be created more quickly and helped to sell newspapers by adding visual flare and creativity. During this time, *The New York Times* regularly published sophisticated infographics, whereas *USA Today* started publishing infographics as a way of delivering the news daily to serve information snack-style by way of simple polls turned into easy to digest nuggets. The technological sophistication of infographics from this time has escalated, as electronic infographics began to allow user interaction, even starting to be termed *interactives* rather than infographics (Nichani and Rajamanickam, 2003).

Public awareness of infographics has now increased. They are routinely published online by data journalists and digital storytellers who combine visualisation with narrative (Giardina and Medina, 2013). Online infographics often manifest as a complete story or an article, which has been turned into an image by combining text, images and data visualisations (Krum, 2014). An online infographic is typically presented as a vertical rather than a horizontal layout so that users can scroll up or down easily, rather than moving from side to side, which assists digestion of information. Online infographics are highly shareable and engaging, and are often used as peoples’ primary source of news and information (Krum, 2014). They can also be highly interactive, whereby readers are presented with a non-linear narrative that offers *“alternative explanations, inviting verification and new questions”* (Segel and Heer, 2010 p.1139). Consumer entrepreneurs and marketers have quickly cottoned on to using infographics as a way to drive traffic and engagement to their online enterprises. Online infographics are now used for many different purposes such as advertisements, PR, visual explanations of data, CV’s, as a call to action, or information source (Krum, 2014).

**The Provision of Infographics as a Service**

Designing a beautiful and artistic infographic subsequent to completing the procedural mechanisms of quantitative research, should be a service that academics provide. While we do not wish to open a debate on the nature of aesthetic beauty (Kieran, 2006), we contend that in order for an infographic to be successful it should deliver four service components: novelty, informativeness, efficiency and aesthetics. First, it should be novel. As Iliinsky (2010) states *“it must go beyond merely being a conduit for information and offer some novelty”*. Novelty of course is a key requirement of many services. *Netflix*, for instance, with its novel delivery platform has revolutionised how consumers watch television (Allen *et al.* 2014). In the same way, if readers encounter a ‘novel’ infographic they will hopefully have their interest piqued. The experience of novelty is highly valued by customers, as it triggers hedonistic effects such as surprise, delight and excitement (Palmer, 2010).

The second service component is that the infographic must be informative. When readers encounter an infographic, gaining knowledge through information must be the primary driver of the visual (Krum, 2014). Creators must pay keen attention to the intended message and the context of use, as well as to the data itself (Iliinsky, 2010). Many services, of course, are informative, some purely. Consider the *NHS choices* website, designed to take away some of the strain of patients wishing to see human medical professionals. It offers a glossary of ailments so that patients, suitably informed, could perhaps self diagnose and treat their maladies themselves. When an infographic acts as a vehicle for arming its readers with knowledge, it will then become a powerful communication tool. Information has a key role in many services, and has been examined more recently particularly in relation to online website navigational effectiveness (Mazaheri *et al.* 2012). In this forum, the informativeness of a site also rests on the distinction between the firms *“intended site atmosphere”* and *“consumers perceived atmosphere”*  (Mazaheri *et al.* 2012). Consumers have also noted that a site’s informativeness rests on a balance between the quantity of information available, and its credibility (Trocchia and Janda, 2003).

The third service component a succesful infographic must possess is efficiency. It must have *“a clear goal, a message or a particular perspective on the information that it is designed to convey”* (Iliinsky, 2010, p. 2). Superfluous content should be kept to a minimum to avoid crowding out the reader with noise. Efficiency is a critical value-adding component of many services. The Japanese ‘Shinkansen’ bullet trains are widely considered to be the best in the world for their speed, punctuality and reliability. Delivering the customer a core service in a seamless fashion is the aspiration of most service providers. Certainly, if an infographic can communicate a body of relevent information in a glance, which would otherwise take time and energy to read, its efficiency is high. Efficiency has been viewed in the services marketing literature as needing to be a part of a customer-centric culture which aims to understand customer needs and surpass customer expectations through the fostering service and performance competencies (Beitelspacher *et al.* 2011).

The fourth service component is that the infographic must be aesthetic. Aesthetics are of course a key part of creating something that is both beautiful and artistic (Iliinsky, 2010). In the case of an infographic, aesthetics must be used appropriately. A graphical mix of elements such as axes, layout, shape, colours, lines and typography must be sympathetically applied, with the delivery of informativeness always being at the forefront of the designers mind (Suda, 2010). In many cases, less is more. Aesthetic elements of a service can be a critical factor in its positioning. In the independent coffee market, for example, aesthetic is everything in communicating the quality and authenticity of their service. At present, coffee houses are frequently adopting a minimalist, refined and elegant look using raw wood and Scandaniavian design features, so that their coffee can stand out as a truly individual expression of place. Daly *et al.* (2014) considered aesthetics in relation to their innovative ‘service theatre’ performance in Galway, as a means of measuring its effectiveness. They found that creating harmony between the aesthetic elements to be a challenging act of balance, something which they could only assess with a ‘fresh eye’ once the performance was over.

By viewing the provision of an infographic as a service, comprising of four distinct component parts, the potential value that academics could add to their work is clear. Importantly, this service does not change the chosen method of academic enquiry used in research, but serves as an additional feature to enhance its merit whilst still using some familiar visual techniques. Entertaining this additional labour may seem unneccessary, silly, or even laughable to some, but creating beautiful visulisations that go on to be widely adopted have not always stemmed within the conventions known to their creators. For example, consider Harry Beck’s London tube map, not created from cartography, which was the standard visualisation tool for maps at the time, but instead inspired by an electrical circuit. This freed the presentation of the tube map up to more accurately reflect the realities of travel in the tube system, as overground geography is not needed when travelling underground (Iliinsky, 2010). This beautiful masterpiece of visualisation has become iconic and demonstrates that forward thinking ideas usually deviate from the usually expected formats or ‘the norm’.

Having considered how the provision of an infographic can be viewed as a service, we will now move onto looking at how structural equation modelling (or SEM), a technique which is very often applied in services marketing research, could benefit from being infographicised.

**SEM in Essence**

The proliferate quantitative marketing research technique, SEM, is a combination of path and confirmatory factor models, incorporating latent and observed variables (Schumacker and Lomax, 2010). SEM has been routinely adopted by top-tier marketing and consumer behaviour journals (Baumgartner and Homburg, 1996), as complex relationships can be examined through the use of complete and simultaneous tests of relationships between constructs (Hardy and Bryman, 2010). SEM uses models to represent relationships among observed variables to quantify whether hypotheses stipulated by the researcher are supported (Schumacker and Lomax, 2010), allowing the researcher to both combine and confront theory with data (Fornell, 1982). Along with its vast appropriation by marketing and consumer researchers, a debate has raged for decades that questions the use of SEM. Many advocate its rigor and sees it as a gold standard of empirical testing (Anderson and Gerbing, 1988; Bagozzi, 1984; Bagozzi and Yi, 1988; Steenkamp and van Trijp, 1991; Fornell, 1982; Baumgartner and Homberg, 1996). Whereas others caution that SEM is now driving marketing research rather than enabling it; that the tail is now wagging the dog (Baron, 2010; Freedman, 1991; Brown, 2001).

In Bagozzi’s (1982) address at the beginning of a special issue on causal modelling in the Journal of Marketing Research, he acknowledges how SEM can be applied to the area of marketing, and correctly predicted its acceleration as an important methodological tool. Indeed, SEM has been branded a statistical revolution (Cliff, 1983), with properties advancing psychological knowledge (Bentler, 1980). Fornell (1982) also advocates SEM as being a useful tool for theory building, well suited to the continual development of knowledge both effectively and efficiently. Others agree, denoting that modeling is at the heart, the core of marketing science (Steenkamp and Baumgartner, 2000), through its ability to converge psychometric and econometric analyses, preserving the best of both approaches (Fornell and Larcker, 1981). Conversely, Freedman (1991) states that models are not a suitable way of empirically examining the social sciences, because the techniques assume we have knowledge which we do not have, the models and phenomena must be connected, and results must not only make sense in code, but must also be transferable to real life. Taking a postmodern perspective, Brown (2001, p. 92) ruminates on marketing’s obsession with packaging knowledge into boxes, stating *“like Furbies, computer viruses and genetically modified soya beans, they are everywhere, they are unstoppable, they breed like rabbits on Viagra…sounds cruel, I know, but until such times as they build a better matrixtrap, we're stuck with extermination”.*

Whether you are an advocate or sceptic of SEM, a latitudinous issue exists concerning the divide between academia and practitioners (Brennan, 2004; Baker, 2010; Uncles, 2010), and between academics who compose the different flavours of our varied marketing constituencies (Shankar, 2009). Certainly, the audience of academic work varies from external practitioners to internal scholars (Baker, 2010), each with their own skill sets and seeking different things from the fruits of our labour. The challenges of satisfying such diverse audiences are bound to create suspensions between expectation and fulfilment, and consequently, within marketing academia, large information bottlenecks exist.

This paper suggests the use of an interpretive lens during the final phases of SEM or model-based work in order to disseminate and market our marketing research more effectively. SEM has the potential to fulfil criteria for impact; it just needs to be treated a little differently, perhaps with a dash of interpretive post-positivist flavour. More flair and panache in the results stages could raise a paper’s knowledge mobilisation, rather than beating the data so hard that it lies lifeless and numerical, unable to reap inspiring conclusions.

A SEM/Interpretive blend is suggested as a successful method for capturing a more holistic and contextual portrayal of phenomena under study (Jick, 1979). Blending of interpretive methods and SEM could have benefits through both observing the same phenomenon from different perspectives, but also concurrently improving our understanding and the communication of that understanding by allowing for a keener and deeper focus on meanings. It also lends itself to knowledge portrayal through infographics.

The rules and templates that demonstrate rigour with SEM, can, at the same time, place restrictions on the study findings and their dissemination. Often, the contributions of SEM studies are couched in modeler language (for example, inclusion of a different moderator, or identification of mediators). Arguably, these arcane justifications only address the ‘so what?’ question for the benefit of the modeler fraternity, and could lack impact with the majority of the potential beneficiaries of the marketing insights. Blending interpretive methods with SEM may be a way forward. Consequently, we clarify the purpose and process of blending interpretive methods and SEM, and follow this with an example of how it can be put into practice via an infographic.

**From SEM Path Diagram to Infographic**

In accordance with the four identified components of a service arts perspective we hope to make the outcomes of SEM studies both interesting and accessible to those parties who are not statistical modelers. With this in mind, the authors will now detail how, by focusing on these components, it is possible to translate a SEM model into an infographic as a service offering. The SEM model selected for illustrative purposes, was chosen for expediency and convenience. It first appeared in a publication by one of the authors. Specifically, it undertook to identify how online fashion retailers can simulate attachment to their web sites by using different communication media (REFERENCE REDACTED TO AVOID REVEALING OUR IDENTITY TO THE REVIEWERS). The path diagram from this work is shown in Figure 1. As it stands, the path diagram (Figure 1) is a representation of the relatively inaccessible modeler’s world view of how different elements of a website (product images, videos and social tools like recommendations and community) might work together to produce different attachment effects (trust, loyalty and purchase intentions). Using this as a starting point the researchers attempted to turn the model into an infographic. None of the researchers had previous experience of creating an infographic, but one had some experience in graphics and art, while the other was firmly ensconsed in the world of arts marketing. This enabled us to re-interpret the statistical findings and re-package them to make them informative, novel, efficient and aesthetically pleasing in an infographic, which is shown in Figure 2. While we don’t wish to be prescriptive, this process could be repeated by others who wish to offer the provision an infographic as a service. We will now move through the four identified components of a successful service and discuss in relation to the creation of our infographic.

**Figure 1 SEM Path Diagram**



**Figure 2 Structural Equation Model as Infographic**



*Novelty*

Keeping the idea of novelty foremost in our minds, the researchers thought about how best to re-interpret the abstract constructs within the SEM model in a startling and provocative manner. We decided that this could be achieved by removing the mathematics from the model completely. While this may not be appropriate for each infographic interpretation of a complex study, we believe that this demonstrates fresh thinking and makes the infographic much more accessible. Another significant change that we made was representing the model as a series of shopping paths rather than abstract relationships. This is a novel interpretive leap which evocatively utilises the metaphor of a journey. By doing this, we are tapping into the trend for storytelling, that is fast becoming a popular methodology in marketing research (Brown, 2006, 2008, 2009; Schouten, 2014; Quinn and Patterson, 2013; Ashman, Solomon and Wolny, Forthcoming). Each story is like a journey which has a beginning, a middle and an end – from the fairytales that we tell young children to the contemporary yarns that hit the best selling reading lists - everyone can understand and be delighted by them.

*Informativeness*

Closely related to efficiency is the idea that our re-rendering of the academic model should be informative. A huge challenge for anyone in a communicative role is finding the best way to convert all their data into meaningful information. According to Stair and Reynolds (2015), in order for information to be valuable it must be accurate, complete, economical, flexible, reliable, relevant, simple, timely and verifiable. The SEM model in Figure 1 is an example of presenting data without meaning (unless you are well versed in statistics). It isn’t flexible because it cannot be used for a variety of different purposes, and it isn’t relevant because it hasn’t been packaged for decision makers (managers) to access due to its complicated nature. However, the infographicised version of the model in Figure 2 converts that data into valuable informative insights. The title, key and the short explanatory abstract are important additions which boost the infographics informational value through meaning that is accurate and complete. All the important facts from the original SEM are present. Titling the infographic immediately contextualises the data in a simple way: at a glance, the reader can see what the image is about. Moreover, the short explanatory abstract goes further, converting the data into actionable information that managers can use to improve their online retail websites. A key is also available for the readers to check the meanings of the images, with the central ‘buy’ image boldly communicating the main purpose of the infographic, to show online features that persuade consumers to buy online. All these additional features are verifiable by referencing the academic paper, and are economical to produce and readily available for consumption in a timely fashion. Referencing the original paper via a hyperlink on the final infographic, or turning the infographic itself into a hyperlink, will provide a means by which curious readers can consider the full complexitiy of the original model.

*Efficiency*

While in some respects the notion of efficiency can seem rather odd, clinical and unrelated to artistry, the central thrust of this component is about being as direct and uncomplicated as possible. To this end we strove to create a simple infographic that allows the viewer to capture the essence of our ideas without having to work too hard – such is the necessity of fast and direct communications in the digital age (Carr, 2011). It’s a delicate balancing act between retaining complexity and over-simplification, and thus risk losing the complicated processes represented by the original SEM. Our new infographic representation allows for this, as a reader can guage the essence of the model without needing to read the academic paper associated with it. This better serves time-pressured managers, who seemingly prefer to absorb executive summaries and snack on synopses rather than spend hours bending over a desk attempting to understand a seemingly obscure academic paper. Using an infographic to present a SEM model also avoids what Baron (2010) describes as the same in, same out or ‘SISO’ phenomenon whereby the managerial implications section of a journal simply regurgitates the information already specified in the literature review, without applying the findings of the results section to arrive with some creative enlightenment. An infographic is also a more shareable format. We believe that our infographic would not be out of place, for instance, being shared via social media. Because of this the efficiency in disseminating this research, and its probable impact, is heightened.

*Aesthetics*

The final component of a successful service is aesthetics. A total design overhaul of the structural model is undertaken in this example, to help us re-contextualise and re-imagine what is a very thin abstraction of mathematical results. As can be seen when comparing Figure 1 and Figure 2, the infographic has a distinctly circular and symmetrical design compared with the sharp angles and assymetries of the original SEM. Angularity is one of the oldest variables in the psychology of aesthetics. Multiple studies have discovered that people prefer circles and curves more than angular shapes and lines (Gordon, 1909; Lundholms, 1921; Kastl and Child, 1968; Silvia and Barona, 2009). Gordon (1909, p. 169) for example commented that *“curves are in general felt to be more beautiful than straight lines. They are more graceful and pliable”.* Moreover*,* Lundholm’s experiment on angularity in 1921 also found that straight lines conveyed feeling of agitation, harshness and furious emotion, whereas curved line are associated with feeling gentle, quiet and merry. We adopt these ideas within Figure 2, designing the infographic around a central, circular motif and using soft edges in the smaller images wherever possible. A circle is more pleasing to the eye because it is symmetrical along all of its axis, whereas angular objects tend to be symmetical along the horizontal and vertical axis only, and are associated with sharp and dangerous objects (Silvia and Barona, 2009).

Kastl and Child in (1968) found round letters to be more pleasant than angular letters, which are seen as serious and threatening. In Figure 2, adding rounded text and bright colours make this model seem much more friendly to a non-statistician. Within the infographic, each symbol represents either a site feature or an attachment effect. We thought about each of the latent constructs one by one and how they could be best represented by an image. These images were purchased from an image bank, but they could easily have been downloaded from the internet through creative commons, or drawn by hand. The images are then placed together in a simple structure where the reader follows from outside to inside, following the paths to purchase into the centre.

*Evaluation*

While this infographic did take time and a few iterations to produce, it does represent a much more readable, user friendly and non-threatening snapshot of the study, whereby a quick interpretation of results is accessible. The infographic shows how computer and design skills can assist greatly in ensuring clarity of message. Where research funding is being bid for, or has already been obtained, a small provision could be made for this service. This would be a very easy and effective way to create professional depictions of research which can be used with multiple audiences as a service, to aid dissemination and impact through delivering novelty, efficiency, informativeness and aesthetics.

The development of the actual infographic involved considerable discussion and reflection into how it could best convey the full complexity of the original SEM model. Numerous ideas were suggested, discussed and ultimately rejected, before we agreed on the final iteration of the infographic (Figure 2). Much of this discussion, of course, was subjective and varied with personal preference. It involved assessing the aesthetics, clarity and workability of various designs. It inevitably involved the slight simplification of certain components of the original SEM, but we do not believe that, in doing so, what has been lost outweights what has been gained. Adopting this approach might not come totally naturally to positivist researchers who are more comfortable with presenting results in the traditional manner without the addition of an infographic service. Nonetheless, while it is likely that many researchers would resist creating an infographic representation of their SEM model, we would urge them to do so, if only to help bridge the gap between rigour and relevance that keeps academic researchers from communicating properly with practitioners.

**Conclusion**

By dint of their design, journal articles that present the results of SEM studies naturally tend to be text-centric affairs, further complicated by tables, equations and statistical tests.  Because of this, journal readers not indoctrinated into the school of quantitative thought can have a hard time understanding the findings of such research (Lehmann *et al.* 2011). In this paper, we use SEM as an example of a quantitative technique that can be infographicised to increase its relevance, impact and audience. It is important that modelers feel that they both can and should go further to provide clarity of findings to a wider audience as a service, and so we have tried to explicitly demonstrate how infographics can be utilised. After all, as Francis Bacon famously quipped ‘knowledge is power’ and if the work of academics is to convey knowledge to others, then why not maximise the potential of that communication by presenting research findings in an accessible format? One way of helping to share the power is to translate the findings of quantitative, or indeed any type of research, into infographics. Seeing the provision of an infographic as a service which academics can provide could fulfill four important service components; novelty, efficiency, informativeness and aesthetics. This paper also contributes to the burgeoning literature on service arts, which is an emerging area of fresh thinking.

Creating an infographic of research results could be undertaken by open-minded researchers by following some of the steps that have been suggested in this paper, either through the use of their own artistic skills, through using infographic software or by employing professional graphic designer. Our ideas presented here may seem radical to some, but the use of infographics and/or graphical representations of scholarship are starting to be accepted in the academic community. They are used by the American Marketing Association, the Harvard Business Review and by the Journal of Retailing (in the form of graphical abstracts). However, the potential that this technique holds remains unfulfilled. Developing a willingness to use these techniques is difficult and onerous. Until a journal editor insists that modelers undertake some translation of their results as a pre-requisite to publication, this paper is unlikely to herald a revolution in how quantitative work is communicated. But moving from path diagram to infographic can be done as shown in this paper. This does require various mental activities which are perhaps beyond the typical modeler’s world view of numbers, formulaes and spreadsheets. Perhaps to some, infographics appear much less rigorous and relevant than a typical SEM, but to the many they appear clearer and easier to understand. Academics can very easily become entangled in a world of rigour as is demanded from top tier journals, but this does not need to necessarily be at the expense of being relevent to applied marketers, to those who don’t know what a R² is, or those within the academic community that choose not to work quantitatively. Communication between a statistician and a non-mathmetician can be harmonious. Using infographics as a service to allow work to become relevant in the eyes of a wider audience could be a unique way to make research more impactful.

**References**

Allen, G., Feils. D. and Disbrow, H. (2014), “The rise and fall of Netflix: what happened and where will it go from here?”, *Journal of the International Academy for Case Studies,* Vol. 20 No. 1, pp. 135-143.

Anderson, J. C. and Gerbing, D.W. (1988), “Structural equation modeling in practice: A review and recommended two-step approach”, *Psychological Bulletin,* Vol. 103 No. 3, pp. 411-423.

Ashman, R., Solomon, M. and Wolny, J. (Forthcoming), “An Old Model for a New Age: Applying the EKB in today’s Participatory Culture”, *Journal of Customer Behaviour.*

Bagozzi, R.P. (1982), “Introduction to special issue on causal modeling”, *Journal of Marketing Research*, Vol. 19, pp. 403.

Bagozzi, R.P. (1984), “A prospectus for theory construction in marketing”, *Journal of Marketing*, Vol. 48, pp. 11-29.

Bagozzi, R.P. and Yi, Y. (1988), “On the evaluation of structural equation models”, *Journal of the Academy of Marketing Science,* Vol. 16 No. 1, pp. 74-94.

Baker, M.J. (2010), “Theory, Practice and Impact in Academic Marketing Research”, *Journal of Customer Behaviour,* Vol. 9 No. 1, pp. 5-18.

Baron, S. (2010), “Statistics in marketing and consumer research”, *Journal of Customer Behaviour,* Vol. 9 No. 3, pp. 229-242.

Baumgartner, H. and Homburg, C. (1996), “Applications of structural equation modelling in marketing and consumer research: a review”, *International Journal of Research in Marketing,* Vol. 13 No. 2, pp. 139-161.

Beitelspacher, L.S., Richey, R.G. and Reynolds, K.E. (2011), “Exploring a new perspective on service efficiency, service culture in retail organisations”, *Journal of Services Marketing,* Vol. 4 No. 3, pp. 215-228.

Bentler, P.M. (1980), “Multivariate analysis with latent variables: causal modelling”, *Annual Review of Psychology.* Vol. 31, pp. 419-456.

Bogost, I., Ferrari, S. and Schweizer, B. (2010), *Newsgames*, The MIT Press, MA.

Brennan, R. (2004), “Should we worry about an ‘academic-practitioner divide’ in marketing?” *Marketing Intelligence and Planning,* Vol. 22 No. 5, pp. 492-500.

Brown, S. (2001), *Marketing: The retro revolution,* Sage Publications Ltd, London, UK.

Brown, S. (2008). *Agents & Dealers*. London: Marshall Cavendish.

Brown, S. (2006). *The Marketing Code*. London: Cyan.

Brown, S. (2009). *The Lost Logo*. London: Marshall Cavendish.

Cliff, N. (1983), “Some cautions concerning the application of causal modelling methods”, *Multivariate Behavioural Research,* Vol. 18, pp.115-126.

Daly, A., Baron, S., Dorsch, M.J., Fisk, R.P., Grove, S.J., Harris, K. and Harris, R. (2014), “Bridging the academia-practitioner divide: the case of “service theatre””, Journal of Services Marketing, Vol. 28 No. 7, pp. 580-594.

Hardy, M. and Bryman, A. (2010), *The Handbook of Data Analysis,* Sage Publications Ltd, London, UK.

Holmes, N. (2012), “Crashing through the type”, *Eye Magazine*, Winter, Vol. 20, No. 82.

Lehmann, D.R., McAlister, L. and Staelin, R. (2011), “Sophistication in Research in Marketing”, *Journal of Marketing*, Vol. 75 No. 4, pp. 155-165.

Fornell, C. (1982), “A second generation of multivariate analysis: An overview”. In Fornell, C. (Ed.), *A second generation of multivariate analysis*, Praeger, New York, NY, pp. 1-21.

Fornell, C. and Larcker, D. F. (1981), “Evaluating structural equation models with unobservable variables and measurement”, *Journal of Marketing Research*, Vol. 18 No. 1, pp. 39-50.

Freedman, D.A. (1991), “Statistics and shoe leather”, *Sociological Methodology,* Vol. 21, pp. 291-313.

Gage, W.L. (1864), “Geographical studies by the late professor Carl Ritter, of Berlin”, *The North American Review*, Vol. 98, pp. 498-519.

Giardina, M. and Medina, P. (2013), “Information graphics design challenges and workflow

management”, *Online Journal of Communication and Media Technologies*. Vol. 3 No. 1, pp. 108-124.

Gordon, K. (1909), *Esthetics*, Henry Holt, New York, NY.

Hair, J.F., Ringle, C.M. and Sarstedt, M. (2011), “PLS-SEM: Indeed a silver bullet”, *Journal of Marketing Theory and Practice*, Vol. 19 No. 2, pp. 139-151.

Hardy, M. and Bryman, A. (2010), *The Handbook of Data Analysis,* Sage Publications Ltd, London, UK.

HEFCE, SFC, HEFCW, DELNI. (2012), “Assessment framework and guidance on submissions”, available at: [www.ref.ac.uk/media/ref/content/pub/assessmentframeworkandguidanceonsubmissions/GOS%20including%20addendum.pdf](http://www.ref.ac.uk/media/ref/content/pub/assessmentframeworkandguidanceonsubmissions/GOS%20including%20addendum.pdf) (Accessed 6th June 2014).

Iliinsky, N. (2010), “On Beauty”, in Steele, J., and Iliinsky, N. (Eds.), *Beautiful Visualization; Looking at data through the eyes of experts,* O’reilley Media, Sebastopel, CA, pp. 1-13.

Jick, T.D. (1979), “Mixing qualitative and quantitative methods: triangulation in action”, *Administrative Science Quarterly*, Vol. 24 No. 4, pp. 602-611.

Kastl, A, J. and Child, I, L. (1968), “Emotional meaning of four typographical variables”, *Journal of Applied Psychology*, Vol. 52, pp. 440-446.

Kieran, M. (2006), *Contemporary debates in aesthetics and the philiosophy and art*, Blackwell Publishing, Malden, MA.

Krum, R. (2014), *Cool infographics: Effective communication with data visualisation and design*, John Wiley & Sons, Indianapolis, IN.

Lundholm, H. (1921), “The affective tone of lines: Experimental researches”, *Psychological Review*, Vol. 28, pp. 43-60.

Lupton, E. and Miller, A. (1999), *Design writing research; writing on graphic design*, Phaidon, New York, NY.

Manghani, S. (2013), *Image studies theory and practice*, Routledge, New York, NY.

Mazaheri, E., Richard, M-O. and Laroche, M. (2012), “The role of emotions in online consumer behaviour: a companion of search, experience, and credence services”, *Journal of Services Marketing,* Vol. 26 No. 7, pp. 535-550.

Meyer, E.K. (1997), *Designing Infographics*. Hayden Books, Indianapolis, IN.

Meyer, R. (2013), “Paul Green, *Journal of Marketing Research*, and challenges facing marketing”, *Journal of Marketing Research*, February, pp.1-2.

Nichani, M. and Rajamanickam,V. (2003), “Interactive visual explainers – a simple classification”, available at: <http://www.elearningpost.com/articles/archives/interactive_visual_explainers_a_simple_classification/> (accessed 6th June 2014).

Palmer, A. (2010), “Customer experience management: a critical review of an emerging idea”, *Journal of Services Marketing,* Vol. 4 No. 3, pp. 196-208.

Quinn, L., Patterson, A. (2013). Storying Marketing Research: The Twisted Tale of a Consumer Profiled. *Journal of Marketing Management*, 29 (5-6). pp. 720-733. DOI: 10.1080/0267257X.2013.771203

Schouten, J, W. (2014). My Improbable Profession. *Consumption Markets and Culture,* 14, 595-608. DOI: 10.1080/10253866.2013.850676

Schumacker, R. E. and Lomax, R.G. (2010), *A beginners guide to structural equation modelling,* Routledge, New York, NY.

Segel, E. and Heer, J. (2010), “Narrative visualization: Telling stories with data”, *Visualization and Computer Graphics, IEEE Transactions on*, Vol. 16 No. 6, pp. 1139-1148.

Shankar, A. (2009), “Reframing critical marketing”, *Journal of Marketing Management,* Vol. 25 No. 7/8, pp. 681-696.

Silvia, P. J. and Barona, C. M. (2009), “Do people prefer curved objects? Angularity, expertise, and aesthetic preference”, *Empirical Studies of the Arts*, Vol. 27, pp. 25-42.

Stair, R, M. and Reynolds, G, W. (2015), *Principles of information systems,* Cengage Learning, Boston, MA.

Steenkamp, J-B.E.M. and Baumgartner, H. (2000), “On the use of structural equation models for marketing modelling”, *International Journal of Research in Marketing,* Vol. 17 No. 2/3, pp. 195-202.

Steenkamp, J-B.E.M. and van Trijp, H. (1991), “The use of LISREL in validating marketing constructs”, *International Journal of Research in Marketing*, Vol. 8 No. 4, pp. 283-299.

Suda, B. (2010), *A practical guide to designing with data*, Five Simple Steps, Penarth, UK.

Trocchia, P.J. and Janda, S. (2003), “How do consumers evaluate internet retail service quality”, *Journal of Services Marketing*, Vol. 17 No. 3, pp. 243-253.

Tufte, E.R. (1983), *The visual display of quantitatice information*, Graphics Press, Cheshire, CT.

Uncles, M.D. (2010), “Is marketing academia losing its way? It depends where you look”, *Australasian Marketing Journal,* Vol. 18 No. 3, pp. 165-167.