

The practitioner view of the top 10 key issues in Business Intelligence – 2014

Peter O'Donnell
Decision Support Systems Laboratory
Monash University
Melbourne, Australia
Email: peter.odonnell@monash.edu

Sophie Sipsma
Carolyn Watt
Eventful Management
Sydney, Australia
Email: sophie@eventfulmanagement.com, carolyn@eventfulmanagement.com

Abstract

This paper presents the top 10 key issues currently faced by Business Intelligence practitioners in Australia. The issues presented were obtained from a series of nominal group technique based meetings held in major Australian cities in late 2013. The meetings involving BI practitioners were designed to elicit their most important BI challenges. "User engagement" is currently the major issue being faced by practitioners. Interestingly, while the topic of "analytics" features in the list, it is not a major concern for practitioners in the field. The list of issues provides an insight into the work performed by BI practitioners that can be used to define a research agenda that is relevant to their needs.

Keywords

Business intelligence, SAP Business Objects, Practitioner opinion, Nominal group technique.

INTRODUCTION

The Business Intelligence (BI) software industry has undergone considerable change in last decade, with a number of high-profile mergers and acquisitions involving the marquee BI software brands including Oracle's acquisition of Hyperion, IBM's acquisition of Cognos and SAP's acquisition of Business Objects. The market power of these large firms has seen the BI industry continue to expand, and the market share of these brands continue to grow. The result has been that BI software and applications has moved from a niche to mainstream market. In the year 2007 – the last year that they were stand-alone firms and had to provide the U.S. SEC detailed financial information – Business Objects, Cognos, and SAS Institute collectively spent US\$773.7 million dollars on research and development (R&D) activities. Since that time, the level of R&D investment has likely increased. That level of investment dwarfs the BI related R&D activity conducted by many other firms and also the university sector. The future of the field of BI is defined to a very large extent by the R&D plans of these vendors. These few vendors effectively define the information systems category of BI.

A number of technological developments during this period have changed the nature of the use cases for which BI systems can be applied. There has been an increased focus on analytical functionality within the BI suites offered by the major vendors. Until recently, analytics and modeling was considered a small subset of BI, dominated by the vendors SAS Institute and SPSS. It is now a mainstream component of the BI software suite provided by the major vendors. IBM has acquired SPSS, and many of the other vendors (SAP is a prominent example) have integrated the open source statistical modeling tool *R* within the architecture of their BI software suite. Assisting in this change has been the development and marketing of in-memory analysis technologies (the most visible of these is the HANA product from SAP) by these main vendors. These technologies allow significant amounts of data to be stored and manipulated in-memory, dramatically improving performance and simplifying the data architecture required for BI systems. The vendors have promoted the use of this technology as an enabler of real-time analysis and more sophisticated analysis.

The consulting firms, precipitated in part by the vendor focus on in-memory technology, but also the success of a series of books on analytics aimed at a business audience written by Tom Davenport (Davenport and Harris 2007, Davenport, Harris & Morison 2010), have also encouraged the notion of "big data" as an essential component of an organization's BI portfolio. Utilizing "big data" means capturing data that has high volume, high velocity, and wide variety (Gartner 2014). Much of this data is unstructured and utilizes newer database

technologies that specialize in the storage and retrieval of unstructured data (for example the Hadoop database system used by Facebook).

Web technologies have continued to dominate as a delivery platform for BI systems, and recent significant product releases from the major vendors have primarily been web-based tools. The rise of the so called Web 2.0 - social media-based web sites - has also impacted on the way people think about fostering the collaboration and knowledge sharing associated with BI systems (Power & Wren 2011). The availability and widespread popularity of easy to use mobile touch-based devices like Android devices, iPhones and iPads, along with the reliable availability of wireless bandwidth, has had a strong impact on the usage of BI systems.

It is interesting to reflect on what impact all these changes: the new technologies and use cases for BI; the expanded role of the larger software vendors in the market; and the continued maturity of the field which has included the increase in the number of University and professional courses dedicated to training and education of professionals in the field, has had on practitioners working in the field. This paper presents a progress report on a project that addresses the question "What are the critical issues facing business intelligence practitioners at the current time?" The project first described in O'Donnell, Sipsma & Watt (2012a) has been running for a number of years. Each year, the research question is answered by conducting a series of workshops to elicit the major concerns of practitioners who develop systems using the SAP business intelligence and analytics software suite. The results are used to develop a relevant and interesting agenda for an annual conference from professional who work with SAP software to create business intelligence and analytics systems (Eventful Management 2014). The workshops are designed to generate a prioritized list of critical issues, which are then used to help define the conference agenda. This paper analyses the results of the meetings conducted in November 2013, and develops a picture of the key issues currently being faced by BI practitioners in Australia in 2014.

The paper is structured as follows: the first section provides an overview of the vendor SAP and the suite of software tools they provide for business intelligence and analytics. This is followed by a description of the research method used to identify the top 10 key issues facing BI practitioners. In the next section of the paper, the top 10 issues are presented. The paper concludes with a discussion of the implications of the findings for both industry and researchers.

SAP'S BUSINESS INTELLIGENCE AND ANALYTICS SOFTWARE

SAP the 4th largest software vendor in the world (Price Waterhouse Coopers, 2013) has recognized business intelligence and analytics as one of a small number of key areas of strategic focus for the organization. They have an extensive range of tools to support the development of BI systems. Their main BI product offerings are the Business Warehouse (BW) tool (SAP 2012a) and the SAP Business Objects suite of tools (SAP 2012b). The experiences of developers who use SAP Business Intelligence software, while comprising a large section of the market, are also fairly representative of the experiences of developers working with tools from the other major vendors.

SAP's first BI related product was developed and released to the market in 1997. This product, called Business Warehouse (BW), is mainly used by organizations that also use the SAP ERP system. It provides fast, multidimensional access to data and also includes tools that provide end-user reporting. SAP BW has evolved over time into a stable, well supported and generally highly regarded tool. Support for the popular and standard multi-dimensional expressions (MDX) query language has allowed the development of a number of 3rd party tools that are compatible with the BW system. End-user access to SAP BW was regarded as the main weakness of the SAP offering in the area of business intelligence. Many organizations preferred to invest in 3rd party tools (accessing SAP BW data via MDX) to develop their data delivery and reporting systems, in preference to the toolset offered by SAP.

This weakness was probably a major motivation for SAP's acquisition of Business Objects in 2007. Business Objects was – prior to their acquisition by SAP – a publicly listed company devoted to the development of BI development tools. The company was founded in Paris, France in 1990. Business Objects' main offerings are report development and data delivery tools. They are generally considered to be easy to use. The key feature of their toolset is a semantic layer – used by report designers to describe diverse, operation sources of data in a consistent, business focused and multi-dimensional format – called the Universe. Business Objects products have the ability to source data, like all the tools offered by the major vendors, from a wide variety of different data sources including SAP's ERP and BW systems.

Since SAP acquired Business Objects, a substantial product development effort has been directed at improving the integration of the existing SAP and Business Objects toolsets, and also at refining and rationalizing their product offerings. SAP Business Objects is considered one of the major developers of tools for BI systems. The analyst firm Gartner consistently ranks them in the "top" section of their magic quadrant market analysis (Sallam, Tapadinhas, Parenteau, Yuen, & Hostmann 2014). SAP, along with IBM Cognos, SAS Institute,

Microstrategy, Oracle and Microsoft, are the main players in the BI software market. All of these vendors offer a suite of tools that support data extraction, storage and distribution targeted at the needs of enterprise scale BI developers.

METHOD AND AIMS

Eventful Management are conference organizers who specialize in developing conferences for professionals working with SAP technologies. They run conferences in Australia, South Africa, Europe, and North America. They will run 30 events in Australia during calendar year 2014. Each event focuses on a specific set of technologies, or a specific application area. They specialize in SAP technologies, but also run a small number of events that focus on Microsoft products. One of the annual conferences (with up to 400 attendees) is focused on the professional community who use the SAP's business intelligence and analytics tools.

To develop the agenda for their conferences, they hold a series of meetings with practitioners to identify the topics they would like to see presented at the conference. The method used to elicit this agenda is described in the next sections of the paper. The aim of the meetings is to answer the simple question "What are the critical issues facing business intelligence practitioners at the current time?" This question is answered by developing a prioritized list of the critical issues facing practitioners. The list of critical issues developed, represents a simple and dramatic insight into the work and concerns of practitioners working in the field of business intelligence. The focus of this paper is the top 10 issues identified in the meetings held in late 2013 which was used as the basis of the 2014 conference.

The Meetings

To develop the agenda for the 2014 conference for the SAP business intelligence and analytics community a series of half-day meetings was conducted with business intelligence professionals. Each of the invited professionals works in an organization that has made a major investment in the SAP Business Objects suite of business intelligence tools. The meetings were held in November 2013 in three major Australian state capital cities: Brisbane, Melbourne and Sydney and also in the national capital: Canberra. The meetings were guided by a facilitator familiar with business intelligence and the SAP Business Objects toolset, and were also attended by staff from the Eventful Group. The same facilitator was used for the meetings in Melbourne, Sydney and Canberra, and another with similar experience used for the meeting in Brisbane. The meetings started at 9am and ended just after noon, with the participants sitting down to eat lunch together once the main discussion had ended.

The Participants

Between 15 and 25 business intelligence and analytics professionals attended each meeting held in late 2013. Around 70 people in total attended the meetings. Most had significant experience with the SAP business intelligence and analytics software suite, with mature systems, and large numbers of end-users to support. However, a small number were from organizations that had only recently acquired the toolset and were just developing their first system. The job titles of the attendees included: BI Managers, Business Analysts, Finance Managers, Reporting & Analytics Managers and Managers of IT. Over 50 different organizations were represented. The majority of the organizations represented were from the private sector. The private sector organizations included manufacturing, retail, transport, and finance organizations. The only exception to this was the meeting held in Canberra where the majority of participants were from Federal public sector organizations. There were a small number of state-based public sector organizations represented in the meetings held in Melbourne, Sydney and Brisbane.

The Discussion

Each participant was provided with a pen and notepad, a whiteboard marker, nametag and nameplate. At the start of the meeting participants were asked to write their name on their nameplate and place it in front of them. Figure 1 shows the setup of a room during a coffee break in the middle of a meeting. The facilitator was positioned at the front of the room – at the opening of the "U". A flipchart easel with a pad of A1-sized butcher paper was placed at the front of the room for the facilitator to use to record the issues that were discussed.

Participants were invited to gather at the venue for coffee at 8:30am in order for the meetings to start at 9:00am. The meetings began with an introduction by the main organizer from Eventful Management. After being introduced, the facilitator would begin the meeting by asking each participant to briefly introduce themselves and the organization they represented. Additionally, as an icebreaker each participant was asked to tell something surprising or unusual about themselves.

Once the introductions were completed the main section of the meeting would begin. Using a technique similar to that used by Lederer and Medelow (1986), the main discussion was conducted using a modified form of nominal group technique (Delbeq and VendeVen 1971). When the introductions ended, the meeting would start with participants being divided in to small groups of between 5 and 7 people. Each group met for a short standup meeting with a facilitator in a different corner of the room. They gathered around an easel with flipchart and were invited to think of the main challenges and issues they faced – the problems that were “keeping them awake at night”. Each group made a list of the main challenges that they faced and discussed which of these were most important. After a short period of time, each group broke up and retook their original seats around the table set up in the room. The issues recorded by each smaller group were then provided to the meeting facilitator. The facilitator then lead a discussion of each of the issues recorded on the group flipcharts, one topic at a time. The group then discussed and explored each of the challenges in more detail. The purpose of this discussion was to gauge if the challenge was common and to ensure everybody in the meeting understood the nature of the challenge. The participants would suggest and discuss solutions and approaches that they had tried (with both success and failure). When an issue had been discussed, the next facilitator would move on to the next challenge recorded. As the discussion was taking place, the facilitator would record the challenge and some of the discussion about it on another flipchart at the front of the room. Examples of the issues recorded on the flipchart butcher paper are shown in Figure 2. Once all of the issues recorded at the start of the meeting had been covered in discussion, the facilitator opened the discussion up to any person who had any challenges or issues that had not yet been discussed. Each meeting was held in a CBD-based hotel meeting room. The rooms were configured in a classic “U” shape.



Figure 1. The room used for the meeting held in Melbourne showing the classic “U” shape setup of the tables and seating. Note the flipchart easel set up at the top of the room for use by the facilitator.

The discussion continued in this fashion for most of the morning. A break was taken for coffee mid-way through the meeting. The discussion would conclude around 11:30am. At this time the butcher paper containing the recorded issues would be stuck up on the meeting room walls. Participants would be invited to suggest any new issues that hadn't been covered in the discussion so far. The facilitator would also suggest some challenges that hadn't been covered in the discussion (perhaps mentioned in previous years or in other meetings) to help ensure nothing major had been missed.

The participants were then invited to vote on the issues. Each participant was allowed 5 votes to vote for the issues that were most important to them. They voted by making a tick in a box on the butcher's paper that recorded the issues. Each vote had the same value. However a participant could if they wanted, vote for the same issue more than once, as long as they did not record more than 5 votes in total. No formal check was made to make sure all participants voted, or that they voted the required number of times. As the facilitator described the voting procedure the staff from Eventful prepared the butcher's paper for voting. This preparation involved making sure each issue was clearly identified on the sheets (separated by a line drawn across the paper), and by adding a box next to the description of each issue for the recording of votes. Once the facilitator had explained the procedure, voting to identify the most important issues was conducted. Once the voting was completed the results were tallied and recorded on the butcher's paper. The photo of the butcher paper used to record two issues discussed in one of the meetings is shown in Figure 2 was taken after the participants had voted and the total votes for each issue had been tallied.

As the meeting closed the participants were asked if they had any other general ideas for the conduct of the conference. The meeting ended with a quick recap of the issues and a discussion of the results of the voting. The participants and organizers would then share lunch together.

The discussions in the meetings were always easy. The participants readily discussed and shared their thoughts and challenges. The discussion during the meetings, as well as during the coffee and lunch breaks was friendly and productive. Many of the participants swapped contact details and agreed to follow-up the offers of assistance that were made. As they left they were given a small gift. They also left with a list of the participants and their contact numbers – intended to help the participants to maintain contact with each other after the meeting had ended.

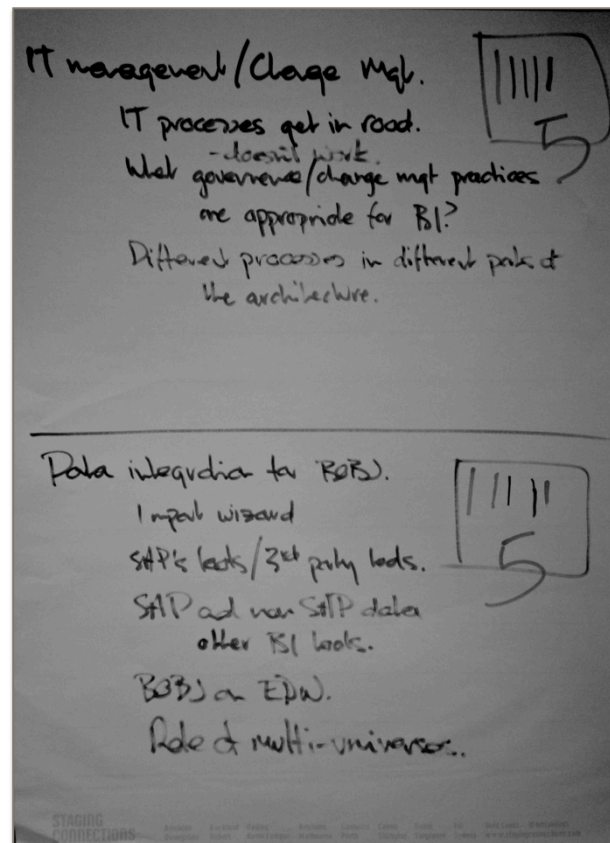


Figure 2. Examples of the butcher paper summaries of the issues. This photo was taken after the participants had voted (note the strokes in each box recording a vote). The votes have also been tallied.

IDENTIFYING THE TOP 10 ISSUES

The final list of prioritized challenges was created based on the data collected in all 4 meetings. The results were combined and the votes for issues that were raised in different meetings were tallied. The list was reviewed to see if there were some issues that could be combined or split. Often, different words were used to describe the same issue at different meetings. Sometimes, a larger issue at one meeting was split into several separate issues at another. For example, at one meeting an issue “3rd party tools for mobile BI” was raised. This issue wasn't raised at any other meetings so it was included into the broader issue “Mobile BI”. This combining of the issues into a single consolidated list was performed by the Eventful staff who had acted as observers during the meeting. The consolidated lists were double-checked at the end of the process by the facilitators. Once created, the final list of issues was distributed to the meetings participants for their information and for comment. The top 10 issues from the final list are shown in summary form in Table 1. The next section of this paper discusses each of these 10 issues more detail highlighting the concerns and specific problems that the practitioners discussed in the meetings.

Table 1. The top 10 issues for 2014

Rank	Issue	Votes	Votes %
1	User Engagement	38	12.8%
2	Improving the Perception of BI in the Business	36	12.1%
3	Data Management	26	8.8%
4	Self-Service BI	25	8.4%
5	Mobile BI	20	6.7%
6	System Upgrades	17	5.7%
7	Tool and Data Integration	15	5.1%
8	Improving System Performance	14	4.7%
9	Moving Towards Complex Analytics	13	4.4%
10	Predictive Analysis	11	3.7%
11-24	Others	82	27.6%

THE TOP 10 ISSUES - 2014

Issue #1 – User engagement

Engaging business users was considered to be the most significant challenge faced by the practitioners. While there are many facets to this issue, a constant theme in the discussions was the feeling that while organizations had invested in the latest versions of the BI tools and had created the infrastructure and systems to deliver relevant and up-to-date information to end-users, they hadn't gained the attention or interest of their end-users. BI systems are being created that are not well used, and as a result organizations don't fully realize the potential return on the investment that they are making in their BI systems. The practitioners want to understand how to help end-users understand the complexity of BI and the options available to them. Most felt the systems and potential of BI was overwhelming for most users, to the point that users would simply give up trying to use the BI systems provided for them and instead create their own system with an easy-to-use tool like Microsoft Excel. They also felt most end-users were also frustrated by how long it takes to develop new reports or respond to requests for changes to existing reports. The practitioners want to know how better to manage those expectations and to respond more quickly user requests. Communication with end-users was also noted as a problem that impacted user engagement. It is difficult to effectively communicate with a large number of users. An aspects of this that impacted the usability of their systems and also led to user frustration was the need to create and use standards and definitions for measures and metrics that are included within the systems. The practitioners also felt that there was a significant difference in the nature of expectations of users from different generations, and would like to be able to better work with end-users from different age groups.

BI systems often change, and the discussion covered how important change management strategies were for the implementation of new tools, interfaces, processes and post-upgrade. The practitioners would like to know more about the common change management models that could be applied to BI systems, and how the approaches might be able to adapt to different types of users. Associated with change management was concern about how best to train users. Most did expensive one-to-one training; while this is the norm they wondered whether it was really necessary. They would like to know what other forms of training could be used and how cost-benefit analysis might be applied to the different forms of training. Training and engagement of users in remote locations was a problem many would like to solve. The practitioners would like to share experiences with others about training that has worked. Many felt that the development of internal user groups was an important strategy to use when training and building user engagement. Many noted that "power" users needed to be trained and engaged differently – if on-side they could play an important role in helping other users get the most out of their BI system.

User resistance to the change represented by the implementation of BI systems was also seen as a major obstacle to effective user engagement. The practitioners would like to know more about how to identify where the pockets of resistance are centered and working closely with those teams or individuals.

Issue #2 – Improving the Perception of BI in the Business

Despite the strong belief in the immense potential business value of their systems' reporting and analytics capabilities, many practitioners felt that the BI function was not viewed positively by the majority of business users within their organizations. IT, in most organizations, is not a popular or widely respected function. The shift of BI from niche to mainstream, has seen it become more strongly associated with an organization's central IT function, resulting in a halo effect of negativity towards BI and the professionals working on BI systems. Information and news about BI systems often gets lost in the information generated about other IT systems in the organization.

The practitioners wondered how to overcome the negative perception of the service they offered and the systems they created. It was mooted that the BI function should sit outside of the mainstream IT function, which could help overcome some of the negativity towards BI, however, there was uncertainty about the merit of this, and they wanted more information about how best to structure and site the BI function within an organization.

The practitioners felt it was really important to create a strong culture of BI within the user community. The BI function had to be "sold" and marketed to the business. The skills and services that the BI development group has to offer are not well understood by most business managers or potential system end users. Many felt that it was important to cultivate BI champions among the executive team and also to use power users as advocates of the benefits of BI. Many of the practitioners felt this general approach was the right one to take but weren't sure about how to do it, or if they had the skills required to develop a strong BI culture in their organizations.

Issue #3 – Data Management

Practitioners were very keen to understand processes that can be used to improve data quality. They recognized that successful BI relies on good data quality, and that data access needs to be quick and easy. There are a number of different solutions, techniques and technologies (including tools from SAP such as SAP Data Integrator, SAP Data Services and Meta-Data Manager) that can be used. However, the practitioners felt they didn't know much about how these tools can be used, what they were good for and what their limitations were. Many felt that the use of standards and compliance procedures, especially in regard to meta data management was valuable, but again would like to know more about what worked and didn't work in that regard. There was uncertainty about how, and how often, to monitor data quality and who should be responsible for that activity. There was also interest in strategies that could be adopted to manage very large data volumes. Third party data management tools were discussed; there was particular interest in the role these tools might be able to play in managing data quality and performing data quality audits.

There was also discussion of the strategies and technologies that could be used to incorporate data from unstructured sources, such as document libraries and social media systems, into the BI data infrastructure so that it could be made available for analysis and included within reports. This interest included dealing with the increasing issue of 'Big Data'. What are the best tools and strategies to deal with large data sets? Many knew SAP products can be made to work with analytics tools like Hadoop Hive that are designed to work with unstructured data. Many like using the term big data. While they didn't necessarily think the concept was relevant or important to them, they were happy to use the term to gain interest from the business in BI.

There was discussion about the role the business itself could play in data management, with a focus on strategies that could be used to get the business to own and certify data processes. The role of information custodians was of particular interest, though they wondered if these businesses focused approaches - while appealing in theory - would work in practice.

Core BI data management issues like the nature and role of the data warehouse in the overall BI architecture and data modeling, especially using the multidimensional approach, remain major concerns for the practitioners. SAP has recently introduced multi-source universes (a "universe" in Business Objects is a semantic data layer that provides end-users and report designers with a multi-dimension view of data), and the practitioners wondered about the implications of their introduction on best practices.

Issue #4 – Self-Service BI

Self-service BI allows business users to create their own reports, offering them greater ownership and taking the demand away from the BI and IT teams. The move to self-service is becoming ever more popular, but there are a large number of factors that need to be considered for an organization to successfully deliver self-serve reports and analytics. One of the main things considered is how much flexibility to give to users. Providing a lot of flexibility will allow users to create the reports they want in the form that they want, however, it may result in unnecessary duplication, inefficiency and inconsistency in reports. Numbers calculated and used for analysis by one user might be different to those used by another. Providing too much flexibility might undermine the efforts

of the BI team to manage and create a trusted source of organizational data. Conversely, controlling the users too much, restricting their ability to select and define their own data, to create their own report styles and formats might help reduce redundancy and ensure consistency of the data use in reports, but it might annoy and restrict users so much that they choose not to use the system at all.

End-user training was seen as a major problem. It was felt that to be effective, training needed to be targeted to the needs of each specific group of users. Problems arose as people moved in and around the organization, and the reports they leave behind might not be well documented, understood or needed by the people who replaced them. New people needed to be trained. Good support is vital to help users creating their own reports, however the practitioners didn't not know how to best resource or provide that support.

Issue #5 - Mobile BI

Mobility has become a pervasive, and somewhat controversial, issue in every organization. Executives, shop-floor, sales professionals and customers alike are requesting reports on their mobile devices, which need to be both intuitive and effective. The practitioners want to meet this demand - often from very senior executives, a user cohort too important to ignore. However, they are unsure about the real business value of delivering BI data to mobile devices. The technology landscape to enable this is also fluid. SAP has some technologies that enable systems to be delivered to devices like the iPad. However, SAP's main dashboard creation technology (SAP Dashboard Designer) relies on Adobe Flash, which means it can't be used for iPad systems. SAP has developed systems and capabilities to create mobile BI systems based on HTML5 but these were seen as being unreliable and lacking in features. There was significant uncertainty about SAP's plans for technologies and tools to be used for mobile development. Further complicating the picture, there are a number of 3rd party tools (for example RoamBI – Gibbs 2009) that can be used to access SAP BI systems data. As a result of this uncertainty the practitioners face a large number of choices - with regard to overall software and hardware architecture, and development tools - when designing mobile BI systems, and very little information about the implications of the alternatives.

Mobile BI systems security was also considered to be a major issue. Participants were very keen to understand what strategies and technologies could be used to mitigate the risks associated with the delivery of strategic data to mobile devices that could easily be stolen.

Issue #6 - System Upgrades

SAP regularly produces new versions, patches and fixes for their software tools. Many organizations were confused over what, when and how to upgrade their systems. It was often hard to understand the value of some of the available upgrades, and even harder to convince business sponsors of the value to secure funding. The practitioners were very keen to hear about each others experiences and to hear about common and best practices for planning and managing upgrades. They would like to have more tools available to assess the costs and risks of upgrades. Third party dependancies were especially troublesome and tricky to manage (especially for web-based systems). Many also discussed problems they were facing in organizations that were adopting the latest versions of Windows (8 and 8.1), as SAP support for those versions was seen as lacking.

Issue #7 – Tool and Data Integration

There are a large number of components and tools in a mature enterprise-scale BI system. It is difficult to fully integrate many of these tools, even those from the same vendor (like SAP). A well integrated system can facilitate efficiency, improved performance and a seamless experience for your users. However, the practitioners felt that tool integration was a very complex issue, and they had little guidance and education available to them about best-practice methods. It was not unusual for large organizations to have problems with integration resulting from the use of different versions of the same tool (notably Business Objects). Many used third party tools for data access, especially for mobile systems, and tools like Microsoft Sharepoint were common. Using those third party tools, while providing the required functionality, added to the complexity of managing their overall systems architecture. The practitioners were very interested to know more about the capabilities, benefits and problems associated with the various data integration tools that were available to them.

Issue #8 - Improving System Performance

Poor system performance was a problem for the practitioners and a source of frustration for their users. They were very keen to understand any available tips and tricks that could be used to improve their system's performance. They were unsure, when faced with performance problems, what steps they should follow to identify and improve system throughput. They didn't really know where to find the skills and resources to help them understand and improve performance. Common areas of concern included the performance of browsers

when rendering reports or allowing end users to interact with the reports and the performance of tools that integrate with SAP's BW product (esp. Business Objects).

Issue #9 - Moving Towards Complex Analytics

The participants discussed the problems associated with getting their organizations to adopt and use more complex analytics (the problem is very similar to issue #10). Traditional BI systems are good at helping users understand what is happening, but not at helping them explore the underlying reasons for a problem. They felt more complex analytics could provide the ability to better understand the underlying drivers of a business, and better understand the causes of business success and failure. Many felt that this required a specific skill set that didn't exist with many of their end-users. They also wondered if having advanced statistical skills in the BI team - in roles like a data scientist - might help encourage and support this kind of analysis. The practitioners were very interested to hear about what other organizations were doing in this regard, and hoped to learn from success stories.

Issue #10 - Predictive Analysis

The meeting participants discussed the role of predictive analysis of current and historical data to predict future trends and occurrences in business. They felt a mindset change was required in end users to get them to be more interested in prediction rather than reaction. The feeling of most of the practitioners in the meeting was that most end users had little interest in, or knowledge of, predictive analysis. Some practitioners would like to know more about the commonly used predictive analysis models, and have a method for their application in a business. Others had a good understanding of the techniques and technology required to implement predictive analytics. There was, however, a general interest in knowing more about the community developed statistical tool *R* that is being integrated and used within the SAP software suite. The professionals would like to know more about common predictive analysis models as well as hearing how other companies have benefited from using analytics to look into the future.

DISCUSSION AND CONCLUSION

This paper has reported on a project that addressed the question "What are the critical issues facing business intelligence practitioners at the current time?" The answer has been developed using an approach that has made a systematic attempt to identify, rank and classify the major issues facing practitioners working in the BI field. The list of issues presented helps to provide a basis for academic researchers to better understand the needs of practitioners.

This list represents the challenges faced by practitioners working with a specific technology toolset – SAP's business intelligence and analytics software suite. It is, perhaps, surprising then, how few of the issues are directly related to that technology, or are even specific to the vendor SAP. More surprising, given the nature of change that the field has gone through in the last decade, is how fundamental the key issues are that worry practitioners. The vendors and consultants who dominate thought in the field are concentrating on the technologies on in-memory analysis and "big data", the Universities have been focussed on the creation of degree programs to teach data science and business analytics. This activity doesn't address the main concerns of practitioners. They are faced with an ironic challenge. At a time when it is possible to read option that business analytics is the main source of competitive advantage in the modern business world (Davenport, Haris and Morison 2010), and that data science is the sexiest job of the current era, in their day-to-day work they face a struggle for recognition. The systems they build are underused, undervalued and they have poor reputations with the end-users they try to serve. They need help with "people" rather than technology, with culture building rather than system development.

Few researchers are addressing these problems. Arnott and Pervan (2009), in their recent wide ranging empirical analysis of the literature in the area of decision support systems noted the majority of academic research into decision support systems isn't directly relevant to Business Intelligence practitioners. Among their recommendations, they argued that DSS research could be improved by shifting "research agendas towards the effective development and deployment of data warehouse and business intelligence systems" (Arnott and Pervan, 2009). No doubt that is easier to say than to do. However, the list of critical issues presented in this paper represents a useful basis for researchers to form a relevant research agenda that deals with problems of interest to practitioners.

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