

SAS MSc Business Intelligence: A Flexible Approach

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Abstract

The Masters Course in Business Intelligence was set up due to industry demand and was designed to address the current skill shortage by combining education and SAS training. This paper will give a brief outline of the structure and content of the course along with a reflection on the first year of delivery in full time mode. The main focus of the paper will outline the design of a new part time MSc which incorporates the flexibility required to allow students to study whilst in employment

Introduction

The School of Computing and Management Sciences at Sheffield Hallam University(SHU) is internationally recognised for its up-to-date, flexible courses and its strong links with industry, commerce and the public sector. The School has currently 2000 undergraduates and 600 postgraduate students, benefiting from our commitment to combine academic rigour with relevance to the world of work. We have a vibrant set of postgraduate courses, many of which have been developed in partnership with employers to make them relevant to their needs. The success of these courses has been built on a reputation for value, namely:

- Real, relevant, state of the art course content
- Professional courses for professional people
- Designed by industry for industry
- Sponsored/supported by major players
- Immediate benefits for the student and their sponsor
- Commercially oriented projects geared to specific problems

The School launched the CareerMSc.com programme in March 2000. This programme has been designed to produce MSc qualified professionals who will have direct hands on

knowledge of products from companies including Oracle, SAP and SAS Software. The programme integrates seven months of intensive Masters degree modules, which cover the conventional aspects of IT, Business Intelligence and management with training and a certification programme in one of the industry product sets mentioned above. Students are expected to undertake a placement in a suitable company to practise their system and software skills, and at the end of the course will produce a dissertation based on their experiences.

As indicated by the following comments made at the launch of CareerMSc.com, the venture has been very well received.

"This partnership with Sheffield Hallam University is a unique and pioneering piece of work. It is designed to address the business needs of the market place, there is no doubt there is a skills shortage, and it is not in the technical area, but in applying that knowledge to a business environment. Our customers are desperate to get employees with a combination of rigorous academic training, certification, and business experience. CareerMSc.com is a very significant contribution towards solving these problems."

Phil Bond, Managing Director SAS Institute UK and Ireland

"CareerMSc.com graduates will walk out of university one day, and the next day be applying the absolute state-of-the-art technology and research thinking."

Rhiannon Chapman ex Member of the Universities Funding Council.

The SAS MSc Business Intelligence Course

(a) Why should students choose this postgraduate course?

The aim of the course is to produce technologists with problem solving, communication and organisational skills, who can exploit and innovate with the new and established technologies, to develop enterprises of the future. The course incorporates SAS Certified training delivered by SAS trainers. Combining studies of best practice, established theories with real case studies and speakers from industry, it explores the complex challenges that organisations currently face. With the mixture of education and training it will develop a new breed of person with the expertise in:

- Consultancy, team work and research skills
- Data warehousing, data management and data quality
- Data mining and statistical analysis
- Strategy and enterprise business intelligence (e-intelligence)
- Applications and web integration

At the end of the course they will be effective problem-solvers and technical professionals who can ensure that organisations effectively exploit information to add business value and who can improve organisations' overall competency in business intelligence exploitation.

(b) Benefits to Sponsoring Organisations

The benefit of the course is not just for students but also for sponsoring organisations. They will be able to:

- Second current staff to the course
- Recruit new staff to sponsor on the course
- Sponsor students on the course
- Send graduate recruits as part of their graduate development programme

With resulting benefits:

- Develop highly skilled information professionals who can make a significant contribution to the future of their organisation
- Gain early payback when candidates start work after seven months of intensive study and SAS training

- Benefit from the broader perspective candidates will bring to their organisation
- Have an opportunity to influence the development and content of the course via an advisory panel.

(c) Our First Full Time Cohort of Students

A full time version of the MSc commenced in October 2000, with an enrolment of 10 students. At the time of writing the course has been running for a period of only nine months, during this period, feedback from both staff and students has been positive. At this stage of the course development it is worth noting the following.

1. The student's professional background affects how they respond to different curricula areas. Experience from this first cohort of students has shown that students from an IT background have found the business aspects of the course more challenging. (e.g. Strategy Management unit). However, students with a business background found the IT aspects such as the Business Intelligence Tools and Techniques units more demanding. It was noticed that by the end of the intensive study stage of the course, students were generally more confident in both IT and business aspects of Business Intelligence.
2. As expected some students found the adjustment to full time study from employment difficult at first. It was pleasing to see how the group work incorporated into the course was beneficial in helping these students to adjust.
3. A particular success was the leasing of laptop computers to the students. It enabled students to work off site on their assessments. In addition, by loading specialist software onto the laptop, students have been allowed to access this at any time.

At the end of June students completed the intensive study stage of the MSc and started the professional development stage where they work in a business intelligence organisation. During this period they will also be working on their dissertation. The completion of the professional development stage results in a dissertation and the award of the MSc Business Intelligence with full SAS Certification. The following student testimonial provides an interesting insight into the first year of the course.

Testimonial by Michael Leak Full Time MSc Business Intelligence 00/01

Career Background

2 years Database Marketing and 3 years Marketing Analyst for the Alliance & Leicester plc. 3 year SAS experience. Currently sponsored by The Alliance & Leicester plc.

Why I Chose The Course

"When I left University I wanted to change the world. I wanted to make an impact in the world of marketing. Five years of work experience had gradually conditioned me into the organisational way of thinking. I wanted a course, which would not only give me a formal recognised qualification but provide me new ideas and a comprehensive toolkit in which I could instantly add value to the company that I work for. Finding a course that covered the theoretical and practical disciplines involved in business intelligence, combined with SAS skills was a great selling point to me. The course in some respects is very broad, embracing many different disciplines from strategic management to application development, allowing me a deeper understanding and appreciation of these disciplines. I believe at the end of the course my sponsoring organisation will have obtained value for money. I will not only be able to go back into the organisation and work a lot smarter but I will be able to contribute far more value and make a real difference. Business intelligence is the future and this course will help me play a part in it."

The Development of the Part-time SAS MSc Business Intelligence Course

It was noticed that, as enquiries came through for the SAS MSc, that many enquirers were unable to take up the offer of a full-time place as this would mean giving up their employment and, in some cases, funding the course themselves. It was also seen that employers wanted the benefits the course offered, but were unwilling or unable to allow their staff to be out of work for the duration of the course. The provision of the part-time route satisfied the needs of the employer as well as the rationale behind the introduction of the course in the first place.

Consequently, a mailout was organised by SAS comprising of a short questionnaire to obtain information on the possible demand for a part time MSc Business Intelligence course. The results obtained from the returned questionnaires are summarised in Table 1.

Table 1: Summary of responses from 52 questionnaires

Please indicate below which aspect of learning you would be interested in	Percentage indicating interest	
MSc Business Intelligence with SAS training and certification	81	Demand for MSc and SAS training
MSc Business Intelligence only	25	
SAS training and certification only	40	
Please indicate your preferred attendance mode		
Full time over one year (with attendance in Sheffield for seven months followed by in-company project)	6	Demand is for a Part-time route
Part-time over two years (with attendance in Sheffield for one week in every six weeks)	47	
Part-time over three years (with attendance in Sheffield for one week in every 10 weeks)	53	
Please indicate the nature of your interest		
On behalf of my organisation	31	Nature of interest is mixed, with personal interest being the greatest
On behalf of myself and a number of colleagues	38	
Personal	56	

NB: Percentages do not total to 100% as a response of yes was sometimes given more than once in a question

The results from the survey indicated a potential demand for a part-time route. In order to deliver a part-time route the course had to be adapted to allow the part time students to attend alongside the full time students, but in such a way as to minimise the disruption in their work place. Whilst discussions were taking place about the mode of delivery, it was felt that this was an opportune time to reflect on the units delivered in the first year and to build on the strengths and adjust for any weaknesses. These discussions resulted in a block mode of delivery and a change in the structure of some of the material in the original course.

(a) The Course Content for Full and Part Time Modes of Study

The MSc consists of 12 units all worth 10 credit points each, except the dissertation, which is worth 60 credit points. Students who obtain a total of 180 credits, will be awarded an MSc. Intermediate awards of Postgraduate Certificate and Postgraduate Diploma can be awarded respectively for 60 and 120 credit points if the students have accumulated credits for the Data Management and Quality unit, the Data Warehousing unit, On-line Analytical Processing and the two units in Business Intelligence Tools and Techniques.

A brief description of the content of the course is given below.

- Managing People and Teams

This one week intensive unit has both a people and technology agenda; the influence of technology on managing people and working in teams. Project management issues and the development of both group and personal development plans are explored. Group work and internal and external speakers are major features of this unit.

- Data Management & Data Quality, Data Warehousing, On-Line Analytical Processing

The role of these three units is to familiarise students with the concepts, design tools and technologies available to develop advanced information systems to support global business interworking including the use of Online Analytical Processing (OLAP). This encompasses the development of data warehousing systems to support business decision making.

- Strategic Management

This unit provides a thorough grounding in the essential qualities, components, principles and practices of strategic management. Students are introduced to the major issues that the senior management of organisations should address when defining the roles that

corporate strategy, information and information systems should play within their enterprises.

- Information and Knowledge Dynamics in Organisations

The trend towards globalisation largely brought about by rapid developments in Information and Communication Technology is placing particular pressures on organisations to enable them to compete in the world economy. Information and its management is becoming increasingly important to organisations in both operational and strategic terms. In an increasingly dynamic environment, organisations require flexible and effective information and knowledge management frameworks to identify, model and share critical information and knowledge within the organisation and its environment and also to communicate appropriately with external parties. In this context, this unit explores how organisations can better manage their information and knowledge for strategic advantage. Issues such as the social, cultural and political aspects of using, providing and accessing information and the development of information strategies will be considered.

- Issues in Consultancy and Research Skills

Quantitative and qualitative research methods, methods of enquiry and problem-solving skills are key components of this course. This unit has been designed to prepare the students for their dissertation and work/ placement.

- Practice and Principles of Web Systems

This unit introduces the student to the technology, tools and techniques relevant to contemporary web system development and deployment. Effective web systems are essential to many businesses with global uptake of e-business solutions and innovations.

- Applications Development

This unit explores approaches to the development of business applications including the technologies that support and enable this process from a software engineering perspective. This unit focuses upon defining the interaction between the business logic and presentation logic and identifies good software engineering practice in this context. The overall perspective focuses upon identifying end user requirements and the techniques for effective user interface design.

- Business Intelligence Tools and Techniques 1 and 2

The importance of developing strategic direction for organisations can draw on many of the large quantities of data available in data warehouses, data marts etc. It was felt that to

utilise the information contained in such large quantities of data it is necessary for the students to be able to appropriately extract and interrogate 'intelligence' from the data. These two units are designed to provide them with an understanding of relevant Business Intelligence Tools and Techniques and methods for validating their successful application. By presenting appropriate statistical and data mining techniques alongside each other, the pros and cons of these techniques can be demonstrated.

- Delivering Business Intelligence

Throughout the course the student will be exposed to a series of units which build upon the previous units and take the student further on through the process of developing an application that addresses a business / enterprise requirement. This unit has been designed to draw upon that previous learning and SAS training to allow students to demonstrate their ability to bring together the theory and practice in developing and delivering a real, practical application.

- Project and Dissertation

The purpose of this phase of the degree is to offer the student an opportunity to demonstrate mastery of a particular subject area by undertaking a pure or applied research project and then writing up the findings in a rigorous and academic manner, leading to the dissertation. The student will be able to explore a situation of interest normally in a real world environment and then develop a research protocol to enable the situation to be investigated. The student will be asked to justify the approach adopted. Both the outcomes of the research and methods used will be evaluated.

- SAS Training

A total of about six weeks of SAS training will be delivered at SHU during the programme. Delivery will be staged to allow for appropriate skill development to go hand in hand with theoretical development. The latest product training includes

- system essentials
- data management
- business intelligence
- application development
- web development

(b) Delivery of Part-Time Mode

The new mode of delivery was designed to allow each unit to be delivered in blocks. This meant that a part time student attends for one week for each unit they were studying. Consequently, for each unit a pack of recommended reading and set work is made available to the students (both full time and part time) prior to the teaching block. The students would then attend classes for one week and have further work to do over the following three weeks towards the assessment for that unit. A part-time student who elects to study over two years to Postgraduate Diploma level would be required to attend a study residential block about every six weeks depending on the year and taking into account national holidays.

Any work to be done outside the teaching block would only involve individual work or work in virtual groups. If presentations were required these would be delivered only in the week of attendance.

In addition to the teaching blocks for each unit, the students are expected to attend for the SAS training at any of the SAS training sites in UK and Dublin.

The schedule of delivery for year 1 of the part-time route and the full-time route is shown in Table 2.

Table 2: Schedule of delivery for Year One of the Part-time and Full-time Routes of the MSc SAS BI

Week	The Full-time route	Part-time student's first year
1	Pre-reading off site	
2	Induction	
3	Managing People and Teams	
4	Assessment	
5	SAS training week 1	
6	Pre-reading off site	Student attends
7	Data Management and Data Quality	
8	Assessment	
9	SAS training week 2	
10	Pre-reading off site	
11	Data Warehousing	
12	Assessment	
13	SAS training week 3	
14	Pre-reading off site	Student attends
15	Strategic Management	
16	Assessment	
17	Pre-reading off site	
18	Information Knowledge Dynamics in Organisations	
19	Assessment	
20	Pre-reading off site	Student attends
21	Issues in Consultancy and Research	
22	Assessment	
23	SAS training week 4	
24	Pre-reading off site	
25	On-line Analytical Processes	
26	Assessment	
27	Pre-reading off site	Student attends
28	Practice and Principles of Web Systems	
29	Assessment	
30	Pre-reading off site	
31	Applications Development	
32	Assessment	
33	Pre-reading off site	
34	SAS training week 5	
35	Business Intelligence: Tools and Techniques 1	Student attends Student attends
36	Business Intelligence Tools and Techniques 2	
37	Assessment for BITT 1	
38	Assessment for BITT 2	
39	SAS training week 6	
40	Pre-reading off site	
41	Developing Business Intelligence	
42	Assessment	

The Future

We are now seeing the need for even more flexibility as employees are still finding it difficult to take the time off work in one week blocks. This may mean a move to Distance Learning with attendance being purely for the SAS training sessions at Sheffield Hallam University.

Sheffield Hallam University has a well respected portfolio of distance learning courses and so the expertise is available. One of the deciding factors will be whether independent study is the right medium to satisfy the rationale and objectives of this course. This is the challenge for the team in the future!