Using Decision Intelligence activities for Management & Marketing Analysis for Decision Support.

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Introduction:

Through the combination of various data sources, and using newly available software and various analytical statistical techniques, new frontiers of management information are opening up to managers, through the intervention of the statistician or intelligence analysts. As well as through business intelligence software like the COGNOS range of products, reporting of various data interrogations and front line data analysis as a desktop tool is becoming an every day place. One of the biggest problems facing the new breed of desktop detectives is the locating and combining of unrelated data, from both external and internal sources into a comprehensive picture or profile. Another problem is the challenge that with the growing complexity of data manipulation, how do we not get bogged down in the trap of over complex reporting activities and outputs, and to ensure that the reporting structure transforms into a simpler format through reporting and diagrammatical representations.

The presentation will be a practical representation of various techniques and activities on the conjunction of dealing with data, the manipulation of various software packages, and tips and tricks of data representation as well as how various Decision Intelligence methodologies can enhance managerial and marketing decision making.

Overview of the project:

This profiling activity is to examine our profile in the education market place through our gains and losses of student applications to UTS. It is hoped that this activity will give us some signposts in future directions of marketing activities, performance indicators, quality issues and decision support. Through combination of different data sources, the various staff expertise's through out the university, the end users need management information, decision intelligence and statistical techniques. It should be possible to build up a better indication of our market position in different demographic segmentations, as well as helping other investigations such as surveys and focus group activities.

The aims of the project are:

- Competitive intelligence and decision intelligence activities

- Bigger Market Share for our organization

- Develop Practices & Procedures

- Better information & knowledge to the decision makers

- Distribute information & intelligence.

The concept:

One of the first steps in developing the project was to gain an understanding of the various facets of the project and the concepts behind it. The following diagram is a concept map of the main focuses, which were believed to be the major considerations involved.

Software - The development of desktop applications which make number crunching and statistical analysis a simple process, and make various tools available which are flexible to many different facets of analysis.

Resource Collection - To conduct literature searches for other education institutions as well as other places who conducted information and intelligence practices, and to examine and apply these techniques to our situation if suitable.

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Information - To locate and understand what information we already had in our organization and to then locate or gather any other information that we needed.

Statistics - To research the various statistical methods that are used in this type of analysis, and to also examine and adapt non-traditional methods to our applications.

Decision Intelligence – Decision intelligence is a new discipline that combines cognitive science, information science and decision making. Its aim is to explore various methods to help people make better-informed decisions though the combination of information and intelligence practices.

Some Possible Investigations arising from this activity.

- Student preferences to UTS and other Universities.
- Student churning of preferences
- Student applications losses and gains
- UTS student preferences via discipline group
- UTS applicants HSC subject choices
- Patterns of UTS applications by Post Code
- Pattern investigation of demographic variables for UTS applicants
- Performance of UTS students from application data
- UTS student performance indicators
- Activity based costing models & funding models
- Market surveys and focus groups
- Quality issues in teaching results
- Subjects and courses take up rates, attrition rates, drop outs and retention.

Software:

The combination of software was very important for the success of the project. Through combining the various different software outputs and with the integration between the different software applications, it became possible to get a fast and accurate picture. This gave a speed advantage and the availability to answer adhoc queries. This integration also gave us the opportunity to be data explores, and to freely follow patterns of data trails and to refine data searches. The more advanced software from COGNOS, also allowed us to explore the relevancy of some investigations, and to check some of the variables in the data sources for inclusion or exclusion in the analysis. The following applications are considered to be important to the investigation.

- **MSWord:** A word processor used for the creation of reports.
- **MsAccess:** A database program, which will be used for data warehousing, data manipulation and creation of files for analysis.
- **MsExcel:** A spreadsheet program used for compiling results, graph creation and some basic analysis.
- **WordPerfect:** A word processor for reporting functions.
- **QuattoPro:** A spread sheet program used for data analysis and graphics.
- **SPSS:** A statistical package, which is used to clean data, provide statistic analysis, produce graphs, performance reporting activities, clustering activities and some basic prediction.
- **Impromptu:** A data warehouse interrogation program, which is used by other COGNOS products to produce analysis and reports. It is used for the creation of data marts and snapshots of data, for analysis.
- **Powerplay:** An investigation and reporting software package, which will make the statistical outs more flexible, as well as creation of various reports, and answering adhoc questions.
- **Transformer:** A data transforming program to create powerplay cubes for analysis and reporting.
- **Scenario:** A data mining computer package, that sorts through the bulk of the data and points towards the areas and explores the value of various subsets of the data for further investigations.
- **4Thought:** A data mining and data exploration software, that creates models of best fit, trend analysis, what if scenarios, strengths and weakness, grouping linking and interactions, degrees of significance, simulation and modeling.
- **NUDIST:** Is a qualitative data package used in survey analysis, this would be mostly used for further marketing data activities, such as surveys and focus groups.

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Data inputs and outputs for the project:

The following diagram is a concept map description of the desired inputs and outputs for the project. The central focus of the investigation is to profile our customers and to better understand their location and demographics variables. With this information available were able to better allocate resources and marketing practices. Through a better understanding of our customer's profiles, we were also able to use the information to refine our operations and procedures.

Demographics: Where the student come from and the possible social / economic indicators for other potential market places.

Transport: The different distances and transport available from different regions to our campuses.

Location: The locations that are more important to our customers.

Competitive data: Any data we can get on our competitor activities and their market place locations.

Feeder Groups: What student are doing with study and subject choices and where our potential customers will be located and their interests and needs in coming years.

In House Information: To explore our own previous customer's profiles, to ensure our market focus and to better understand our tradition and to give us a solid basis for growth.

Application Data: To examine our current and previous applicant's profiles. The match our previous applicant's profiles against performance indicators.

Marketing: To better understand our marketing opportunities and the best allocation of our resources.

Logistics: To better understand our customer movements and to ensure a quality of service and facilities to better provide an positive educational experience.

Budgeting: To pursue an activity based costing models and better understand our budget constraints.

Product: To ensure that our products are competitive in the market place.

Administration: That we have efficient administration activities, which provide a smooth throughput of customers concerns and activities, and the provision of quality customer data.

HRU: That we have a good idea of our future customer needs, and to unsure that our staff levels are adequate (within budget considerations) for the delivery of our products and services.
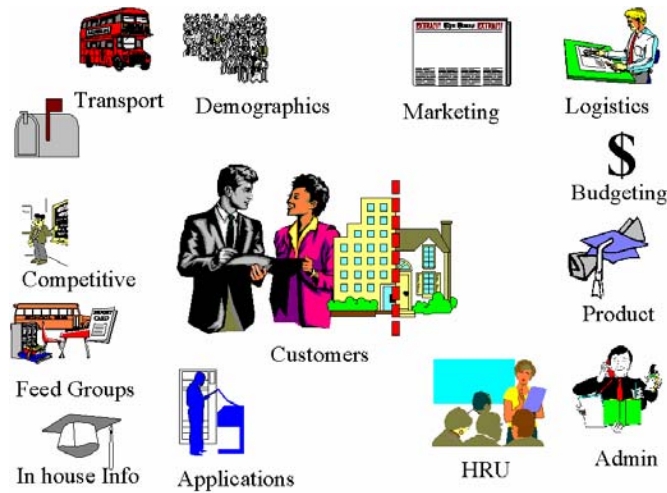
Implementation strategy:

The following table is a list of the functions, process and purposes of certain activities involved in the project. These strategies are a combination of management, intelligence, information collection and research activities. The purpose of following plan was to help integrate the various unlike data sources, as well as the establishment of data–warehouses and data-marts for the project. Without this organisational process the project would have been delayed or less efficient.

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| Function	Process	Purpose.
Resources	Gathering the data	Seeking out the possible data sources and defining the available resources.
Investigation	Researching & locating the various data sources	Examination of the available data resources and culling and refinement of said resources. Seek out alternative and non standard data sources, which add value to the process.
Collection	Gather data from the various sources.	Gathering and collecting the data for further investigations. Making sure that the data is formatted and stored in an easily retrievable format.
Information	Making sense of the data.	Retrieving data & creating of basic reports on the data, and making some basic assumptions about the data.
Organisation	Storing the data in a retrievable format	Reshaping the data into a retrievable format and storing data in a filing or computer system.
Classification	Sorting, and reporting of information.	Creating links between different data sources. Creating different basic reports. Getting a feel for the information.
Intelligence	Adding value to the information.	The amalgamation of many data sources into a coherent form.
Analysis	The combination of various pieces of information.	Combining and examination of various information and data sources into an analytical framework for the construction of intelligence for informed decision analysis.
Profiling	Defining a desired target group and the locating of that group.	Profiling is the process of ascertaining characteristics, which are closely associated with a particular target group and the subsequent searching of databases to identify other individuals who have the same or similar characteristics.
Strategy	Developing a plan to achieve a set of goals.	Taking an organisational approach to developing a series of action plans to reach a desired audience.
Targeting	Taking the profiling data & develop a profile of desired persons and locations.	Defining the action plans of the desired strategies in reference to the target audience and the market reach into the profiled geographic regions.
Methods	Examine and decide on the methods of reaching desired persons.	Locating the best methods of reaching the desired audience and creation of a timetable, project management, resource allocation and rostering.
Tactics	The physical activities of reaching the desired persons.	Instigation of various strategies, and the formation of various activities for reaching the target audience.
Delivery	The act of sending a message to the desired persons.	Perform designated activities in regard to the action plan in conjunction with resource allocation and time management in the projection of desired messages to the target audience.
Review	Reflection on the results.	Follow up on the various activities. Create a report with performance indicators, and evaluate feedback from recipients and team members.

Location profiling.

It became important to have a better idea of the locations that our customers came from, hence we undertook a process of profiling our most relevant locations, to gain a better understanding of the demograpics of our customer base.

The example is of the surburb of Lane Cove, which is a surburb just north of the sydney, and a location about ½ way between two of our service provision centres.

We found that the creation of a standardised profile measure and the comparision of these measures against the Australian Bureau of Statistics and other such data soruces.

Lane Cove Post Code Profile

Total Pop 30107   Female 52% Male 48%   Aust Citizens 85% 18+ 66%
Higher Education 6% Tafe 2.7% H School 6.8 % Any H Education 15%
Size 11 Sqkm Disadvantage Index 1140.53 Urban Advantage Index 1156.06
Rural Advantage Index NA Economic Resources Index 1141.06
Education & Occupation Index 1185.4
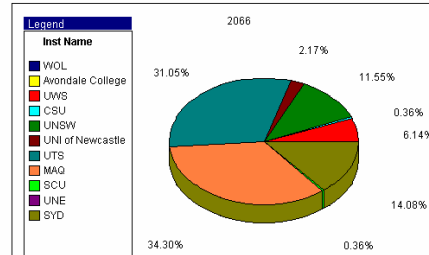
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**Comparison of different attributes by post code.**

One of our more interesting outputs is the comparison of different attributes of the different market places, and the layout of demographics.

Here we can see 5 different snap shots of the Sydney basin, and the different demographic areas from various indicators. The lightest colours are the more positive locations, while the darker areas are the least active areas.
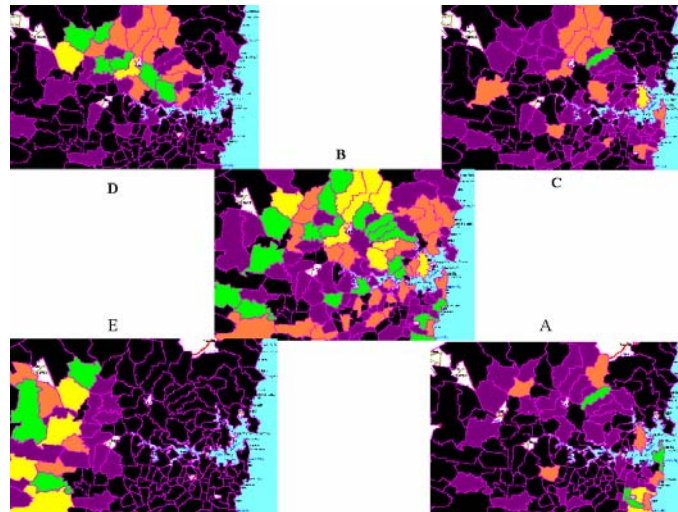
Sample pie segmentation chart of market share.

This pie chart is an example of the COGNOS powerplay output of a data set. With his reporting and investigation software, we have the opportunity to explore various data combinations. The software also allows us to use various tables, with the ability to create many leveled and 3d cross tables. With this function, combined with the graphic interface we are able to provide quick answers to questions, and to conduct real time investigations.
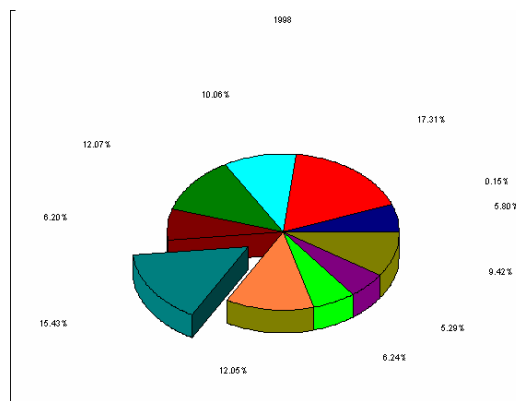
In conclusions:

I would like to thank you for attending the conference presentation or for the reading of this paper. The management information officer has developed much of the project over the last 4 years. We are still exploring the various outcomes, as well as partnerships and strategic alliances in regard to the results, as well as potential growth opportunities. There is a lot of growth in this type approach and analysis in dealing with decision making. Much of our approach is becoming common place in the business community. Many opportunities now exist for commercial exchange and joint research into the different methodologies. The faculty of Business at UTS is already exploring various interactions with both friends and competitors.

It must be stated that this project and its activities are micro focused, and seeks to integrate with the universities activities at all levels, however the main driving focus for this project is the Faculty of Business. To ensure the success of this project, we have had to go thought some business reengineering processes and examine some of our support activities, as well as information provision and strategic plans.

The project is an ongoing project, with still a lot of room for growth and development. We have found that there have been some unexpected side benefits to the project, with a transdiscipline approach to both academic and administration activities. The project is also fairly resource intensive, with computer power as well as software applications.

If you have any questions or comments about this project please feel free to contact Tony Nolan at the contact details given on the first page.