TECH FOR YOU

Data Analytics – The tool to transform data to decisions[1]

No matter how new or mature enterprises and business are to data analytics, the stern and often sour reality is that plenty of business struggle to comprehend its benefits in helping an organisation grow. Data analytics provides a way to gather, cleanse, organise and evaluate data and helps in evaluating patterns which in turn help enterprises to identify solutions and problems before they spiral out of control. This article will help you gain insights on the use of data analysis and the best possible way to use these analytics.

Introduction

The rapid advancements in Information Technology (IT) and it's pervasive deployment has empowered enterprises with the capability to collect, process, share, transmit and store vast amount of data relating to all aspects of business operations ranging from customer inquiries to stakeholder needs. Typically in a large enterprise which has automated its operations, there are multiple sources and channels of data capture, encompassing not only internal operations, but also external interfaces resulting in continuous stream of data flowing in and out of the enterprise at increasing speed. IT can process data and provide information but drawing the right inference from this requires human interference. IT does not have any capability other than what has been programmed. IT can process information at great speed as required but the logic, flow and presentation has to be designed and programmed for use by the business process owners based on the need, utility and the required objective. Data can be captured, processed and stored by computers but drawing conclusions from it requires expert analytical skills by skilled professionals and the use of the right tools. Currently, using IT is imperative and enterprises deploy IT for most of their core business processes. But the key leverage is the power of IT in achieving enterprise objectives by ensuring that IT is not merely used for routine data processing but is an aid to decision-making through intelligent data analysis.

Power of Data

The power of enterprise data can be harnessed by usage of data analytics and business intelligence tools. To derive value from the huge volume of data stored in diverse formats in multiple systems across the enterprise, and over the years in different versions of IT infrastructure requires using the right type of data analysis. Readers may please refer to the article titled: "Using Business Intelligence (BI) Tools and Techniques" published in December 2011 for more information on BI tools. Data analytics requires identification of the business problem, transforming the required data into information using data mining techniques. Based on this information, required action has to be taken and the results monitored. In the current IT era where most enterprises use IT, Data analytics could be the key differentiator for enterprises to gain competitive and strategic advantage. Data analytics promotes a culture of informed decision making by using the vast pool of enterprise data by drilling down, summarising, analysing and helping in getting ROI from Data.

CAs – Need for Data Analysis and Data Analytics

The International Federation of Accountants (IFAC) in its publication: "How to Make Your Small Practice a Big Success - Practice Management Tips for Small and Medium Practitioners" outlines the need for SMPS to embrace new technologies and states: "To compete effectively, SMPs should consider automating their processes to improve efficiency and turnaround times and, in turn, lower costs. In addition, they should be aware of new technologies - both to help their own practices and so they can advise their clients on technologies that may help them operate more effectively. Helping clients identify and implement new technologies can serve as a value-added service, which can help generate new revenue, as well as boost client satisfaction and loyalty". One of the core competencies of a CA are his analytical skills which are used by a CA not only for auditing but also for providing business consultancy. Hence, they are in the best position to use IT for data analysis and data analytics.

Data, Data Everywhere

Enterprises today produce more data than ever and these emanate from a variety of different departments or domains such as transactional sales information coming directly from a point-of-sale system (POS), customer data from a Customer Relationship Management System (CRM), and a multiple variety of operational systems running across the enterprise. The disparate data sources may be spread throughout

the enterprise across departments and ranging across geographical and functional divisions. The data sources could be operational databases, in use by each department to record regular transactions and store data that may be frequently accessed and changed. This data may also be dispersed through different applications in a variety of formats, on a range of hardware such as a dedicated storage network, a mainframe, a database server on the Web, or even on various desktops and these systems and data could be anywhere. With all the data available, some of the questions to be asked are: what does this data communicate, and how can this data be analysed to provide better services, help understand the customer better and to make operations more efficient.

Data Analysis

Data analysis is a generic term used to encompass activities related to the examination, interpretation, synthesis, and summarisation of data. In a typical DA deployment, these should translate to employees using software to make sense of data available and making smarter business decisions based on the selected data. In the context of IT audits, data analysis refers to reviewing the availability, adequacy and appropriateness of controls in enterprise's information systems, operations and processes to determine whether the systems in place effectively protects the data, operate efficiently and succeed in accomplishing an enterprise's overall goals.

The data stored on computers is of no real business use if it is not used to improve enterprise's business decisions. For example, an enterprise may be tracking its customers' purchasing behaviours, but if it doesn't analyse these behaviours to determine which products to stock, discontinue, discount, cross-sell, or up sell, it is definitely missing significant revenue opportunities. Effective usage of data analysis requires the following:

- Understanding of the different types of data and the format in which they are available.
- Knowing how to covert these data into a commonly used format and identifying the right software applications and features which could be used to analyse the data.
- Understanding of the various types of business decisions which can be improved through data analysis.
- Understanding of the features of different types of software applications which may include in-house, custom-made, standard software such as MS Excel or high end ERP software or specialised data analysis/data analytics software and using these as appropriate.

Data Analytics (DA)

Data is one of the most valuable assets of an enterprise but if this data is not properly harnessed using IT, it only remains data. DA provides a way to gather, cleanse, organise and evaluate the data and helps in seeing patterns which in turn help the enterprise identify what it is being doing well, determine how to do it better and identify problems before they spiral out of control. DA can be relatively simple and can be done using commonly used software such as MS excel or MIS/Reporting feature of an accounting application. For example, MS Excel offers a good analysis tool for doing fairly routine multi-dimensional analysis in the form of pivot tables. Pivot tables are built from raw dimensional data (as opposed to relational data). Users can design and alter their tables by dragging and dropping particular dimensions onto the two axes of the tables. Users can quickly view the summary of data or report from different perspectives. DA can also be extremely complex and may require merging of data from different sources into a common format for subsequent use in high end ERP/specialised software to perform complex/

comprehensive data analysis as and when required.

DA and Decision Making

DA is defined as the science of examining raw data with the purpose of drawing conclusions about that information. DA facilitates enterprises to make better business decisions. DA is distinguished from data mining by the scope, purpose and focus of the analysis. Data mining involves sorting through huge data sets using sophisticated software to identify undiscovered patterns and establish hidden relationships whereas DA focuses on inference, the process of deriving a conclusion solely based on what is already known by the researcher. Data analytics is used to describe everything from online analytical processing (OLAP) to CRM analytics in call centres. For example, banks and credit cards companies analyse withdrawal and spending patterns to prevent fraud or identity theft. E-commerce enterprises analyse web site traffic or navigation patterns to determine which customers are more likely to buy a product or service based upon current or prior purchases or viewing trends.

In simple words, analytics are technologies and applications that enable enterprises to transform data into actionable insights. This involves three key steps as follows:
- Collecting, managing, cleaning and storing data
- Extracting and analysing data
- Reporting results

DA goes beyond percentages and averages and helps in discovering the diverse relationships between different components of data enabling drawing of the right inference, and thus providing a strategic and competitive advantage. DA requires leveraging real-time data sources by bringing together multiple data sources, predicting (not just reporting) and merging new and existing data sources. The ability to predict the future with a degree of

certainty is perhaps the most game-changing aspect of DA. The results of DA may be used to identify areas of key risk, fraud, errors or misuse, improve business efficiencies, verify process effectiveness and even influence business decisions. If used effectively, DA can play an integral role in enabling enterprises to unlock the treasures hidden in its massive stores of data by identifying areas of key risk, fraud, errors or misuse, improve business efficiencies, verify process effectiveness, and influence business decisions.

Increasing Importance of Data Analytics

Thomas Devonport in his book titled, "Competing on Analytics: The new science of winning", states that significant proportion of high performance companies have high analytical skills among their personnel and successful enterprises put analytics to work to assist their managers and employees to make better decisions leading enterprises to better performance. A report recently released at the Gartner symposium on the Strategic Technology Trends of 2012 high-lighted the importance of analytics and big data as follows:

"Next-generation analytics: Enter-prises will focus on harnessing the power of information by using business intelligence and DA tools to monitor and improve performance and costs. DA is possible not in high end data centre systems but also using mobile devices. In future, IT may be required to focus on developing analytics that enable and track collaborative decision making. Further, enterprises will use technologies for using big data for decisions, new analytic applications and pattern-based strategies.

Big data: Unstructured data is expected to grow by over 80% over the course of the next five years, creating a huge IT challenge. Big data has such a vast size that it exceeds the capacity of traditional data management technologies and requires the use of

new or exotic technologies simply to manage the volume alone."

What Kinds of Questions Can Analytics Answer?

Thomas H. Davenport, Jeanne G. Harris and Robert Morison in their book titled: "Analytics at Work: Smarter Decisions, Better Results" provide a matrix (see figure 1) which identifies the six key questions that data and analytics can address in enterprises. They state that every enterprise needs to answer some fundamental questions about its business. Taking an analytical approach begins with anticipating how information will be used to address common questions. These questions are organised across two dimensions:

1. **Time frame:** Are we looking at the past, present, or future?
2. **Innovation:** Are we working with known inform-ation or gaining new insight?

The timeframe questions are focu-ssed on using inform-ation more effect-ively. The "past" information cell is the realm of traditional business reporting, rather than analytics. By applying rules of thumb, enterprises can generate alerts about the present — what's happening right now (like whenever an activity strays outside of its normal performance pattern). Using simple extrapolation of past patterns creates information about the future, such as forecasts.

The innovation set of questions requires usage of different tools to dig deeper to produce new insights. Insights into the past are gained by statistical modelling activities, which explain how and why things happened. Insights into the present take the form of recommendations about what to do right now — for example, what additional product offering might be of interest to a

specific customer. Insights into the future come from prediction, optimisation, and simulation tech-niques to create the best possible future results.

Taken together these questions encompass comprehensively what an enterprise needs to know about itself. The information presented in the matrix can be used to challenge existing uses of information. For example, many of the "business intelligence" activities are in the top row. Moving from purely information-oriented questions to those involving insights is likely to provide a much better understanding of the dynamics of the enterprise operations.

Figure 1: Key questions addressed by analytics:

	Past	Present	Future
Information	What happened? (Reporting)	What is happening now? (Alerts)	What will happen? (Extrapolation)
Insight	How and why did it happen? (Modeling, experimental design)	What's the next best action? (Recommendation)	What's the best/worst that can happen? (Prediction, optimization, simulation)

Putting Analytics into Action

DA can facilitate embedding enterprise strategy into every aspect of the enterprise. DA provides statistical analysis and modelling services by using enterprise transaction level data integrated with qualitative and external data sources. DA can potentially touch every aspect of enterprise operations and can also focus a specific aspect, for example, how and which customers have contributed to the revenue. Aligning business intelligence, or BI, with an analytics strategy, provides a more comprehensive picture. The strategies for DA could differ depending upon the data available and the need. For example, an enterprise may adopt DA tools to determine how best to use the new data it has available by

analysing the data, and using it in a predictive fashion in terms of what the enterprise can do with it to improve operations and enhance its customer experience.

Some Examples of Common DA Applications

DA can produce incredibly innovative ideas so as to make the best possible decisions for running the business. DA involves applying statistics on top of data and using that to improve forecasting and also perform requisite 'what ifs,' or predictive analysis. DA is expected to play a key role in how the business will move forward in the future and can be deployed in most enterprises for performance management. Some examples of common analytical applications are given here:

regular part of doing business. Embedding analytics into core business processes improves the ability of the enterprise to implement new insights. Effective implementation of DA eliminates the gaps between insights, decisions, and actions.

As IT is an integral part of most business processes today, it offers the best way to embed analytics into processes through the software applications that employees routinely use to perform their jobs. Embedding analytics into processes has to being with a robust analytical architecture which provides accurate, timely, standardised, integrated, secure, and reliable information management environment. Scorecards and applications that monitor and alert based on predetermined thresholds should

1. Finalise plans and mechanism to collect the data
2. Collect data from identified internal/external sources
3. Validate, enter and store data in required devices/systems
4. Extract and transfer data to identified systems
5. Transform and cleanse data base as per set requirements
6. Analyse and interpret data using tools and techniques as required
7. Determine and communicate consequences and recommendations as relevant
8. Initiate and monitor action taken for implementation.

Conclusion

Analytics is expected to increasingly grow as it enables fact-based decision-making process. Research

Industry	Analytical applications
Financial services	Credit scoring, fraud detection, pricing, underwriting, customer profitability
Retail	Promotions, replenishment, shelf management, demand forecasting, inventory replenishment, price and merchandising optimisation
Manufacturing	Supply chain optimisation, demand forecasting, inventory replenishment, warranty analysis, product customisation, new product development
Government	Fraud detection, case management, crime prevention, revenue optimisation
Online	Web metrics, site design, recommendations to customers

How to Implement Data Analytics?

The best way to implement analytics to work in an enterprise is by making it an integral part of everyday business decisions and business processes. DA should be at the core of the methods by which work gets done and value gets created. In an analytical enterprise, analytics should not be relegated to few specialised professionals or used by only a few isolated applications or reserved for special occasions like marketing campaigns but the analytical applications and tools must be used routinely by information workers as a natural part of their daily work. When DA is embedded in processes and workflow, analytics shift from being an occasional ancillary activity to being a consistent, routine, and

be an integral part of the enterprise information system encompassing all core areas rather than being standalone applications accessible to a few employees only.

Systematic Approach to Implementing Data Analytics

At enterprise level, implementing DA requires accessible, high-quality data, orientation within the enterprise for DA, the right analytical leadership environment, setting of strategic targets and pool of analysts with the requisite skill-sets.

At a process level, implementing DA requires a robust approach which encompasses all aspects right from data collection to evaluation. The step by step approach to implement DA through the business information value chain is outlined here:

has shown that successful enterprises are those which deploy analytics as it key differentiator as it reduces ad hoc decision making based on hunches and promotes decision making based on facts which ulti-mately will help enterprises to sustain high performance across business cycles and generations. Using DA, CAs will be able to further distance themselves from the stereotypical role of "bean counters". It will be able to spend more time analysing information, providing strategic advice, and ultimately driving greater value for their clients. The future of DA is now and understanding how to use data analysis and DA will improve not only the audit process but also help CAs to leverage their core analytical skills, and thus, providing value addition to their clients. ■