Applied Business Analytics Program for Senior Professionals

Objective: The widespread proliferation of IT influenced economic activity leaves behind a rich trail of micro-level data. Yet, most organizations are data rich but information poor. Emerging technologies such as RFID, weblogs, social networks, website usage tracking and vast amounts of online information (such as product ratings and bid histories) have the potential to reveal important information about consumer, supplier and competitor preferences to those that have the ears to listen. This certification program helps you:

- Be aware of the potential of business analytics in today’s data rich environment
- Become familiar with leading edge applications and opportunities for leveraging business analytics in different organizations
- Gain a practical understanding of the key business analytics methods, from state-of-the-art data visualization to predictive analytics and data mining techniques
- Understand how to evaluate the potential and outcome of business analytics implementations
- Know how to decide when to use which technique
- Use prediction models to help strategize the course of your company

A programme done in collaboration with Indian School of Business and a Renowned Business School in USA, excellent academic environment in the two schools, well researched pedagogies and highly acclaimed faculty will be the distinguishing features.

Pedagogy: Academic sessions, practitioners views, games & simulations, proprietary exercises and case studies, extensive company visits, project work to contextualize the course for each participant within their firm, immersion in a developed and an emerging economy country

Target Executives: Senior leaders in a company who are involved in decision making. Typical profiles include BI Directors, Brand Managers, Business analysts, Sales Director, Customer Service Director, CMOs, CIOs, Heads of Operations and Research, Heads of Digital Marketing and e-commerce operations.

(Minimum work experience 15 years)

Duration: An extensive 5 weeks certification programme with 2 weeks in ISB and 3 weeks at a US Business School, application project work (in workplace) with periodic interactions, project/case presentation and certificate completion. Total time from start to finish is one year.

Certification criteria: Evaluation on the modules taught and process followed by participants on an individual/team basis for the project work to ensure importance is given to both the end result as well as the path adopted.
## PROPOSED COURSE STRUCTURE

<table>
<thead>
<tr>
<th>Coverage during ISB Leg – 2 weeks:</th>
<th>Coverage during US Leg – 3 weeks:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrative Thinking</td>
<td>Marketing</td>
</tr>
<tr>
<td>Overview of statistics</td>
<td>Supply Chain</td>
</tr>
<tr>
<td>Data Management</td>
<td>Finance</td>
</tr>
<tr>
<td>Data Visualization</td>
<td>Project Leadership and Advocacy</td>
</tr>
<tr>
<td>Forecasting</td>
<td>Capstone case</td>
</tr>
<tr>
<td>Data Mining</td>
<td>Company Visits and Industry speakers</td>
</tr>
<tr>
<td>Contemporary Analytics SAS Module – External</td>
<td></td>
</tr>
</tbody>
</table>

### Coverage during ISB Leg – 2 weeks:

- **Integrative Thinking (8 Hours / 1 Day)**
  
  Organization challenges can be re-tracked back to lot of indicators in terms of data. This module will entail a pro-active approach to arrive at various business challenges and throw up strategies around the same. Creating a strategy aligning business requirements and ensuring data-driven decision making. Ensuring taking informed decisions as a part of strategy formulation and effective execution.

- **Overview of statistics (8 Hours / 1 Day)**
  
  This main focus of this course is employing samples to make inferences about certain statistical properties of the underlying population such as means, variances and proportions. Correlation and Regression; Role of regression in analytics; Linear regression, assumptions, Inference using least squares method, Steps involved in regression modeling, Case study. Software used is R. Survival analysis: Introduction: Censoring and truncation; Characteristics of survival analysis data: Time-to-event data. Missing value analysis: Missing value patterns: Missing completely at random (MCAR); missing at random (MAR);

- **Data Management – Big Data (16 Hours/ 2 Days)**
  
  The basics of Big Data analytics - what it is? Why is it needed? Real-world applications. The fundamentals of the MapReduce programming model to crunch and analyze Big Data and hands-on experience on using Hadoop. Big Data Text Analytics for understanding and mining large volumes of unstructured text data, Big Data Visualization for finding global trends and local structures in Big Data. Databases and Database Users, Database System Concepts; Data Modeling using Entity Relationship Model; Relational Data Model and Relational Database Constraints;

- **Forecasting (8 hours/1 day)**
  
  Regression and time series paradigms of forecasting, visualization and exploration of regression data, forecasting based on regression models, visualization and exploration of time series data, forecasting based on time series models, evaluating forecast performance, neural networks
• **Data Visualization (8 hours/1 Day)**

  Beauty of Data Visualization - what and why; Design concepts – Line charts, Area graphs, etc; Data exploration and Interactive dashboards; Visualization in a multi-device world – using space effectively; Creating meaning with data – Excel and PowerPoint visualization; Time dimension in data visualization.

  Text visualization – tag clouds, keyword weighting, word tree, etc; Social data analysis; Non-traditional and statistical visualization. Advanced Visualization tools (OLAP, Tableau, Spotfire, Qlikview, etc)

• **Data Mining (8 hours/1 day)**

  Classification and prediction; Bayes classification: error probability, Data partitioning and performance evaluation, training set and test set errors, cross-validation; Variable and feature selection

  Principal components; Canonical correlations; Measuring data similarity and dissimilarity; Mining Frequent Patterns – association rules; Pattern Mining; Clustering Methods; Clustering High Dimensional Data; Outlier Detection

• **Contemporary Analytics (8 hours/1 day)**


• **SAS Module on Predictive Modeling (16 hours/2 days)**

  o Data splitting/balancing/over fitting/oversampling
  o Logistic/linear regression
  o Artificial neural networks (MLP)
  o Decision trees
  o Variable importance/odds ratio
  o Profit/loss/prior probabilities

**Foreign University - Leg**

Following is a choice of sessions which can be included in your Certificate Program. These topics cover leading edge application and issues as well as the leadership skills needed to support successful BA management.

**THEME 1: MARKETING (18 hours)**
The modern commercial enterprise begins with the market; if no market exists for your goods or services it is difficult to justify the existence of the organization. The Marketing function seeks to understand the wants, needs, and desires of the consumer in order to translate them into profit-making good and services for the organization.

**Fundamentals of Marketing: understanding the consumer (9 hours)**

In this segment students are introduced to the basic understanding of marketing concepts: segmentation, targeting, positioning, products and brands, pricing, and communications. The communications concepts include more detailed discussions of advertising, promotion, and marketing communications.

The segment begins with a discussion of marketing and statistics and how they overlap and inform one another.

**Marketing Analytics: researching and modeling for consumer insight (9 hours)**

Once the student has become knowledgeable in the basic concepts of marketing, this segment provides a deeper understanding of the technical analytics used to gain insight into the behavior of the consumer. Using statistical tools applied to marketing principles, students learn a number of key concepts: linear models and model estimation, experimental research, sampling designs, demand and optimal pricing models, and conjoint analysis. With these tools students are then able to develop models for marketing segmentation and positioning, and eventually will be able to create models to drive decision making in consumer choice, consumer acquisition, and consumer retention.

**Corporate Speaker from Google or Apple or Deloitte or health care industry**

**THEME 2: SUPPLY CHAIN (18 hours)**

In today’s world class enterprise, the operations and supply chain functions constitute the part of the organization that hold responsibility for creating, designing, manufacturing, and delivering the goods and services that represent the value creation component of the organization. These activities tend to fall into three major areas—Procurement and supplier management (upstream), Internal (or manufacturing) Operations, and Logistics and Inventory Management (downstream)—that together constitute the organization’s supply chain function.

**Process Analysis: How things get done (6 hours)**

Every organization has processes that they use to create value for their customers; whether the company is manufacturing, services, or an educational institution. The process of getting things done is the heart of any organization, and improving those processes is at the core of effective management. In order to improve a process, one must be able to analyze it and break it down into the specific value-adding steps. Students will learn in this segment how to identify, analyze, and improve a process using a number of different tools that include: process mapping and analysis; capacity and flow; bottleneck and constraint analysis; batch sizing; and statistical process control.

**Procurement and supplier management: managing the upstream processes (3 hours)**

Every commercial organization has some sort of supplier network that provides them with everything from office supplies to capital equipment to direct material to fully outsourced manufactured products. The challenge for
decision makers is to clearly understand the value to each of the alternatives presented in a procurement decision so that all of the relevant costs and risks are taken into account in the process. In this segment, students will learn to ensure the alignment between a sourcing strategy and the organizational strategy, understand the concept of Total Cost of Ownership in making sourcing decisions, and value risk in order to assign appropriate costs to various alternatives.

**Logistics and Inventory Management: managing the downstream processes (9 hours)**

Organizations deal with uncertainty on a daily basis, and the analysis of inventory helps to drive the order quantity of purchased goods in the face of uncertain demand. Once that inventory is identified by the organization, the logistics function decides how best to ensure that the material is transported to the right place at the right time for the right cost. In this segment, students will learn a number of models to aid in this analysis: forecasting demand and order quantities in the face of uncertainty; order quantities that maximize expected value for the organization; and, transportation and logistics design to ensure consistency and predictability in delivery. This segment includes an introduction to optimization of these various decisions.

**Company Visit: HEB Distribution Center or Walmart Distribution Center in San Marcos**

**THEME 3: FINANCE (18 hours)**

Finance is the language of business, so any analytics that are performed in a business environment must have a foundation in the financial impact of the decisions.

**Fundamentals of Finance (9 hours)**

In this segment of the course, students will learn the underlying principles of financial management beginning with the concept of maximizing shareholder value. Other key concepts used to value projects and understand the differences between decision making opportunities include: time value of money, risk and return, cost of capital, free cash flow and capital budgeting. Specifically within the topic of capital budgeting students will learn how to use Net Present Value, Internal Rate of Return, Payback, Discounted Payback, and Breakeven Analysis to structure alternatives in the process in order to present to best options to decision makers.

Student will have the opportunity to hear from Finance leaders from top firms such as Wal-mart, CapitalOne, Dell, and Intel.

**Fundamentals of Accounting (9 hours)**

If Finance is the language of business, then Accounting is the grammar. The consistency of reporting results, measuring profit and return, and properly paying tax obligations are critical to ensuring effective decision making. In order to be conversant in the language and grammar of the financial context of business decision making, students will learn several key concepts in accounting. These concepts include: cost behavior and allocation; activity-based costing; joint production profitability, costing, and strategy; product costing; and transfer pricing.

These concepts along with those taught in the finance segment will provide students with a fundamental understanding of the common parameters and context for making decision in a business environment.

**THEME 4: BUSINESS ANALYTICS LEADERSHIP & ADVOCACY (18 hours)**
Advocacy Skills: Selling Yourself and Your Ideas (3 hours)

Innovation is crucial to the success of organizations. But ideas don’t sell themselves. Indeed, history is replete with examples of ideas that go nowhere because of internal opposition. Whether it be Xerox’s leadership ignoring the research of their employees and not patenting notions like the Ethernet or the “windows” sort of computer display or the decision by Swiss watch makers not to adopt the quartz watch, missed opportunities threaten the survival of firms and even industries. Successful innovations need to be “sold” or “marketed” within organizations before they are ever introduced to the marketplace. In this program we examine what successful idea champions do to sell ideas within companies. The session highlights the specific moves idea champions make when they propose their ideas.

Leading the Project Team (3 hours)

Information technology managers today need to lead a diverse team of people towards a common goal in the face of significant risk and uncertainty. In this session, participants will learn to set up and lead high performance teams effectively, even within organizational structures where influence, rather than direct authority, is the primary control mechanism. Complex interfaces are carefully managed using a decision-making process that draws upon a number of effective communication tools.

Conflict Resolution in Teams (6 hours)

Whether internally with colleagues and the business partners or externally with suppliers, IT managers are facing negotiation challenges every day. The ability to prepare for the negotiation process and discover optimal solutions to problems is critical to success. This session presents effective methods to deal with a broad spectrum of negotiation problems faced by IT managers and professionals. Using an IT case, this session will help participants:

- Understand the central concepts in negotiation
- Analyze the negotiation partners and opponents
- Use specific strategies and tactics for successful negotiation

Entrepreneurship: Idea Validation (3 hours)

Information Technology is well positioned to be a successful breeding ground for entrepreneurship because of its low capital requirements, emphasis on intellectual capital and ability to benefit from sweat equity.

This course provides the conceptual, strategic and tactical bases for identifying opportunities in the IT space and the steps necessary to turn it into a successful business, managing in an environment of high growth, high uncertainty and rapid change. The course will include a case study of successful or failed IT entrepreneurial companies. It will present a business perspective (rather than a technical perspective), and will highlight best practices as well as classic mistakes.

Change Management (3 hours)

With ever-increasing changes in processes, technologies, strategies, and the business environment, a CIO is constantly charged with leading change. Effectiveness in this task requires careful navigation of multiple
stakeholders, conflicting demands, time pressures, and a complex set of organizational factors. This session focuses on strategies for effectively leading change:

- Assessing the internal and external context of change
- Building an effective change vision and plan
- Creating evocative calls for change
- Dealing with resistance to change
- Engaging the organization in change

**THEME 5: CAPSTONE CASE PREPARATION & PRESENTATIONS**

**Project Analysis: Making the Business Case (3 hours)**

This session provides a process to build a sound business case for pursuing a new project opportunity. This includes (1) scaling a general stage-gate planning template, (2) setting up the appropriate governance and assurance process, and (3) considering the technical and non-technical risks in the framing process that lead to (4) an Opportunity Roadmap with value-drivers linked to corporate strategy.

**Presentation Skills (3 hours)**

The participants in this session will learn effective verbal and written presentation skills to present ideas with impact, including elevator-pitches, power point presentations, executive summaries, and business plans. Benefits include: learning to deliver the message with clarity and impact, improving delivery skills and overcoming stage fright, interacting effectively with the audience, and keeping the audience interested during the presentation.

**Capstone Case Presentations (6 hours)**

**Industry Speakers & Company Visits**