Business Analytics

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For InfoSys E4

Analytics

- the discovery, interpretation, and communication of meaningful patterns in data

- especially valuable in areas rich with recorded information

- relies on the simultaneous application of statistics, computer programming and operations research to quantify performance

- often favors data visualization to communicate insight

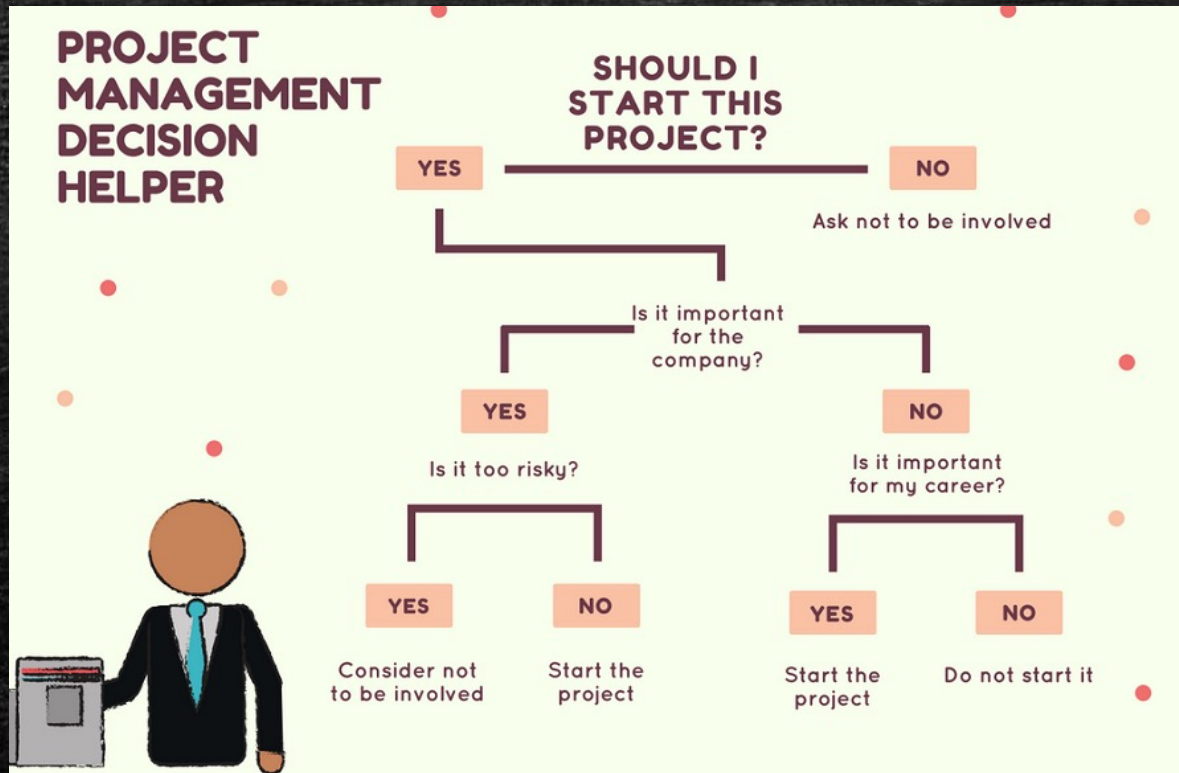- applied in businesses to describe, predict, and improve business performance

Types of Analytics

- Decision Analytics

- Descriptive Analytics

- Diagnostic Analytics

- Predictive Analytics

- Prescriptive Analytics

Decision Analytics (1)

- a systematic, quantitative, and visual approach to making strategic business decisions

- uses a variety of tools and also incorporates aspects of psychology, management techniques, and economics

- often used to assess decisions that are made in the context of multiple variables and that have many possible outcomes or objectives

- NOTE: can easily lead to **analysis paralysis** and, due to information overload, the inability to make any decisions at all

Decision Analytics (2)

PROJECT MANAGEMENT DECISION HELPER

SHOULD I START THIS PROJECT?

YES — NO

Ask not to be involved

Is it important for the company?

YES — NO

Is it too risky?

Is it important for my career?

YES — NO — YES — NO

Consider not to be involved — Start the project — Start the project — Do not start it

https://io.wp.com/intellspot.com/wp-content/uploads/2018/01/Project-Management-Decision-Tree-Examples.png

Decision Tree Example

decision trees and influence diagrams are visual representations that help in the analysis process

Decision Analytics (3)
Example (https://www.investopedia.com/terms/d/decision-analysis.asp)

- A real estate development company is deciding on whether to build a new shopping center in a location

- They might examine several pieces of input to aid in their decision-making process
  - traffic at the proposed location on various days of the week at different times
  - the popularity of similar shopping centers in the area
  - financial demographics
  - local competition
  - preferred shopping habits of the area population

Descriptive Analytics (1)

- the most basic and widely used type of analytics that companies use

- the examination of data or content, usually manually performed, to answer the question "What happened?" (or What is happening?)

- used to produce reports, key performance indicators (KPIs) and metrics that enable companies to track performance and other trends

- summarizes and highlights patterns in current and historical data

- characterized by traditional business intelligence (BI) and visualizations such as pie charts, bar charts, line graphs, tables, or generated narratives

Descriptive Analytics (2)

- Companies use this to evaluate how well they are operating and whether they are on track to attain business goals
  - Business leaders and financial specialists – track common financial metrics such as quarterly growth in revenue and expenses
  - Marketing teams – track campaign performance by monitoring metrics like conversion rates and the number of social media followers
  - Manufacturing groups – monitor metrics like production line throughput and downtime

- How metrics are used:
  - Reports (highlight aspects of business performance)
  - Visualizations (charts to communicate their impact to a wider audience)
  - Dashboards (visualizations to track progress – quicker to view/absorb)

Descriptive Analytics (3)

- What descriptive analytics tell us
  - Current business performance
    - Tracking sales per account representative, sales of each product line
  - Historical trends
    - Track progress by comparing metrics for different periods (example, sales growth)
  - Strengths and weaknesses
    - Compare the performance of different business groups based on metrics like revenue per employee, compare their performance with industry averages or published data from other companies

Diagnostic Analytics (1)

- looks at why things happened

- attempts to identify the causes of trends and anomalies that descriptive analytics may already have identified

- diagnostic analytics applies techniques such as data mining and correlation to examine the relationships within business data

Predictive Analytics

- leverages historical data to predict what could happen in the future

- It forecasts the probability and potential impact of specific future outcomes, helping business leaders take a more proactive, data-driven approach to decision-making

- Organizations can use predictive analytics to foresee the potential impact of problems

- Example: supply chain analytics can help identify supply chain risks and potential future issues

Prescriptive Analytics

- uses the results of descriptive, diagnostic and predictive analytics to suggest actions that businesses can take to influence future outcomes

Business Analytics (BA) vs Business Intelligence (BI) (1)

Business analytics (BA)

- focuses on developing new insights and understanding of business performance based on data and statistical methods

Business intelligence (BI)

- focuses on using a consistent set of metrics to both measure past performance and guide business planning, which is also based on data and statistical methods

Business Analytics (BA) vs Business Intelligence (BI) (2)

Business analytics (BA)

- makes extensive use of statistical analysis, including explanatory and predictive modeling, and fact-based management to drive decision making

Business intelligence (BI)

- querying, reporting, online analytical processing (OLAP), and "alerts"

Business Analytics (BA) vs Business Intelligence (BI) (3)

Business analytics (BA)

- can answer questions like
  - Why is this happening
  - What if these trends continue
  - What will happen next (predict)
  - What is the best that can happen (optimize)

Business intelligence (BI)

- can answer questions like
  - What happened
  - How many
  - How often
  - Where the problem is
  - What actions are needed

Sample applications of Business Analytics

- Banks
  - Use data analysis or analytics to differentiate among customers based on credit risk, usage and other characteristics
  - Match customer characteristics with appropriate product offerings

- Gaming firms
  - Use analytics for customer loyalty programs

- Superstores/Pharmacies/and the like
  - Use analytics for optimizing inventory

Location-based Analytics for Organizations

Introduction (1)

- Organizations employ analytical techniques to gain insights into their existing processes through
  - Informative reporting
  - Predictive analytics
  - Forecasting
  - Optimization techniques

- A critical emerging trend incorporates location data in analytics

- Organizations develop analytics applications to make use of location data that is generated by today's devices (e.g., smartphones)

Introduction (2)
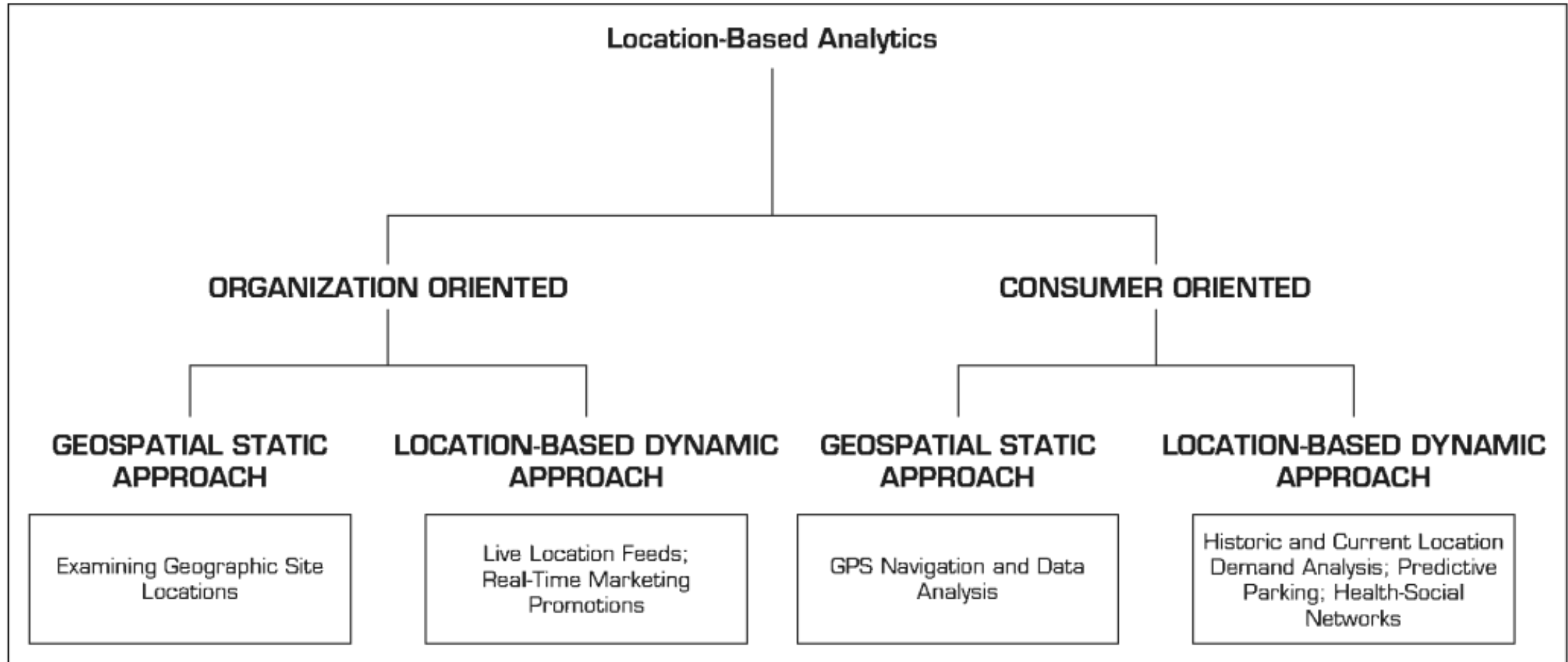
Geospatial Analytics (1)

- A consolidated view of the overall performance of an organization is usually represented through visualization

- This information may include current and forecasted values and key performance indicators (KPI)

- Problems:
  - Looking at various graphs and charts can be overwhelming
  - There is a high risk of missing potential growth opportunities or not identifying the problematic areas

Geospatial Analytics (2)

- ALTERNATIVE: use visual maps that are geographically mapped and based on the traditional location data (usually grouped by the postal codes or *geocoding*)

- These map-based visualizations have been used by organizations to view the aggregated data and get more meaningful location-based insights

- PROBLEMS:
  - Locations based on postal codes offer an aggregate view of a large geographic area and may not be able to pinpoint the growth opportunities within a region.
  - The location of the target customers can change rapidly
  - An organization's promotional campaigns might not target the right customers

Geospatial Analytics (3)

- SOLUTION: make use of location and spatial extensions to analytics

- The addition of location components based on **latitudinal and longitudinal attributes** to the traditional analytical techniques enables organizations to add a new dimension of "where"
  - Traditional business analyses currently answer questions of "who," "what," "when," and "how much"

Geospatial Analytics (4)

- Location-based data are now readily available from geographic information systems (GIS)

- GISs are used to capture, store, analyze, and manage the data linked to a location using
  - integrated sensor technologies
  - global positioning systems installed in smartphones
  - radio-frequency identification deployments in retail and healthcare industries

Geospatial Analytics (5)

- By integrating information about the location with other critical business data, organizations are now creating *location intelligence (LI)*

- What organizations can do now:
  - create interactive maps that further drill down to details about any location
  - investigate new trends and correlate location-specific factors across multiple KPIs
  - pinpoint trends and patterns in revenues, sales, and profitability across geographical areas
  - Retailers can determine how sales vary by population level and proximity to other competitors (assess the demand and efficiency of supply chain operations)
  - Consumer product companies can identify the specific needs of the customers and customer complaint locations, and easily trace them back to the products
  - Sales reps can target their prospects by analyzing their geography

Geospatial Analytics (6)

- mobile applications now enable organizations to target the right customer by building the profile of customers' behavior over geographic locations (Radii)
- extend location-based analytics to use augmented reality (Cachetown)

End of Presentation

Answer the Case Studies on the next slides and pass your assignment to the Virtual Classroom

Case Study 1 (1)
Great Clips Employs Spatial Analytics to Shave Time in Location Decisions

- Great Clips, the world's largest and fastest growing salon, has more than 3,000 salons throughout United States and Canada. Great Clips' franchise success depends on a growth strategy that is driven by rapidly opening new stores in the right locations and markets. The company needed to analyze the locations based on the requirements for a potential customer base, demographic trends, and sales impact on existing franchises in the target location. Choosing a good site is of utmost importance. The current processes took a long time to analyze a single site and a great deal of labor requiring intensive analyst resources was needed to manually assess the data from multiple data sources.

- With thousands of locations analyzed each year, the delay was risking the loss of prime sites to competitors and was proving expensive: Great Clips employed external contractors to cope with the delay. Great Clips created a site-selection workflow application to evaluate the new salon site locations by using the geospatial analytical capabilities of Alte1yx.

Case Study 1 (2)

- A new site location was evaluated by its drive-time proximity and convenience for serving all the existing customers of the Great Clips Salon network in the area. The Alteryx-based solution also enabled evaluation of each new location based on demographics and consumer behavior data, aligning with existing Great Clip's customer profiles and the potential revenue impact of the new site on the existing sites. As a result of using location-based analytic techniques, Great Clips was able to reduce the time to assess new locations by nearly 95 percent. The labor-intensive analysis was automated and developed into a data collection analysis, mapping, and reporting application that could be easily used by the nontechnical real estate managers. Furthermore, it enabled the company to implement proactive predictive analytics for a new franchise location because the whole process now took just a few minutes.

Case Study 1 (3)

Questions:

- How is geospatial analytics employed at Great Clips?

- What criteria should a company consider in evaluating sites for future locations?

- What other applications can such geospatial data be useful?

Case Study 2 (1)
Quiznos Targets Customers for its Sandwiches

- Quiznos, a franchised, quick-service restaurant, implemented a location-based mobile targeting campaign that targeted the tech-savvy and busy consumers of Portland, Oregon. It made use of Sense Networks' platform, which analyzed the location trails of mobile users over detailed time periods and built anonymous profiles based on the behavioral attributes of shopping habits.

- With the application of predictive analytics on the user profiles, Quiznos employed location-based behavioral targeting to narrow the characteristics of users who are most likely to eat at a quick-service restaurant. Its advertising campaign ran for 2 months- November and December, 2012- and targeted only potential customers who had been to quick-service restaurants over the past 30 days, within a 3-mile radius of Quiznos, and between the ages of 18 and 34. It used relevant mobile advertisements of local coupons based on the customer's location. The campaign resulted in over 3.7 million new customers and had a 20 percent increase in coupon redemptions within the Portland area.

Case Study 2 (2)

Questions:

- How can location-based analytics help retailers in targeting customers?

- Research two (2) similar applications of location-based analytics in the retail domain and discuss how they used this to improve their business processes.