Retail Analytics – E-Commerce

Group 9

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AGENDA

1) **RETAIL ANALYTICS**
   - ✓ Industry Practice – Types of Analytics
   - ✓ Information Providers

2) **ANALYTICS IN ECOMMERCE INDUSTRY**
   - ✓ Web analytics – basic metrics, top tools
   - ✓ Data Handling – Software in Trend- HADOOP
   - ✓ Major Analytics Applications in Ecommerce

3) **ANALYTICS IN ECOMMERCE COMPANIES**
   - ✓ Amazon
   - ✓ Flipkart
   - ✓ Ebay

4) **RESEARCH PAPER STUDY**

   Customer Segmentation and Promotional Offers
   - ✓ RFM
   - ✓ Lifetime Value

5) **RECOMMENDATIONS**

1) RETAIL ANALYTICS

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3) ANALYTICS IN ECOMMERCE COMPANIES

4) RESEARCH PAPERS STUDY

5) RECOMMENDATIONS

Industry Practices - **Types of Analytics** – RETAIL ANALYTICS

CUSTOMER ANALYTICS
- Customer Acquisition
- Customer Loyalty
- Behavioral Segmentation
- General Merchandiser - TESCO

MARKETING ANALYTICS
- Marketing Mix
- Brand Health
- Multichannel Campaign Optimization
- Apparel Chain – SEARS CANADA

MERCHANDISING AND PLANNING
- Shelf space optimization
- Product Pricing
- Store Location Decisions
- Fashion Retail – BELK

DEMAND AND SUPPLY CHAIN
- Inventory Planning
- Demand Forecasting
- Product Flow Optimization
- Department Store – METRO GROUP

RISK ANALYTICS
- Detecting Fraudulent activity
- Detecting Process Errors
- Detecting Store Theft
- Online Retailer - AMAZON

PREDICTIVE ANALYTICS
- Determining Customer LTV
- Revenue forecasting
- Product Recommendations
- Trend Analysis

Information Providers -RETAIL ANALYTICS

Market research companies providing retail intelligence

IRI: Information Resource Inc.

- Leader in delivering powerful market and shopper information, predictive analysis and the foresight

- Keeps systems on big retailers, collect info, sell data and trends, simplifies and supports manufacturers and all

Services Provided

- ✓ Market, consumer and shopper intelligence
- ✓ Retail tracking information
- ✓ Online and offline marketing ROI strategy and effectiveness
- ✓ Predictive analytics and modeling
- ✓ Enterprise-class business intelligence software platforms and solutions
- ✓ Pricing, trade promotion and brand portfolio maximization
- ✓ Store level and merchandising insights
- ✓ Strategic consulting and thought leadership

AC Neislen: Another Player in the arena

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Web Analytics – E Commerce

➢ **Web Analytics** involves mainly studying consumer behavior and traffic online

➢ **Ecommerce applications** – study consumer purchase to boost sales, attract more customers, build brand

BASIC METRICS TO TRACK

MEASURE	DESCRIPTION
Visitors	No of visitors tells how business is doing
Page Views	Maximum viewed Tells the popular content
Referring Sites	Tells the interests of customer
Bounce Rates	Tells why people leave the site
Keywords and Phrases	Tells about customers requirements

TOP ANALYTICS TOOLS FOR ECOMMERCE:

TOOL	CAPABILITIES	APPLICATIONS
Google Analytics	Monitors traffic from social media, emails	Measures effectiveness of marketing program
Adobe Site Catalyst	Real time segmentation	Increase checkout conversion rates
IBM Corementrics	Enterprise level Solution, provides actionable information	Know how website affects visitors, advertisement ROI
Webtrends	Digital marketing intelligence	Increase Conversions, Search and social advertising, visitors segmentation and scoring

DATA HANDLING - Software in trend - HADOOP

HADOOP: **Open source software project**

Accomplishes two tasks: **massive data storage , faster processing**

- ► **ADVANTAGES:**

- **Handle huge amount of data -** great volumes and varieties – esp. from social media and automated sensors

- **Low cost -** the open-source framework is free and uses commodity hardware to store large quantities of data

- **Computing power -** distributed computing model can quickly process very large volumes of data

- **Scalability -** can easily grow your system simply by adding more nodes. Little administration is required.

- **Storage flexibility -** can store as much data as you want and decide how to use it later.

- **Inherent data protection and self-healing capabilities -** Data and application processing are protected against hardware failure. If a node goes down, jobs are automatically redirected to other nodes to make sure the distributed computing does not fail. And it automatically stores multiple copies of all data.

Other S/W involved – Tableau, TeraData etc.

Major Analytics applications – E Commerce

Personalization
- Personalization helps to increase conversion rates
- HBR say personalization increases ROI by 8 to 10 times
- Ex: Gilt Group ecommerce company uses targeted emails to give offers matching customer search

Improving Customer Experience
- Analyzing buying pattern to make online purchase seamless process
- Optimizing services like customer call

Pricing
- Develop models for real time pricing of millions of SKU's
- Parameters considers are competition, inventory, required margins etc.
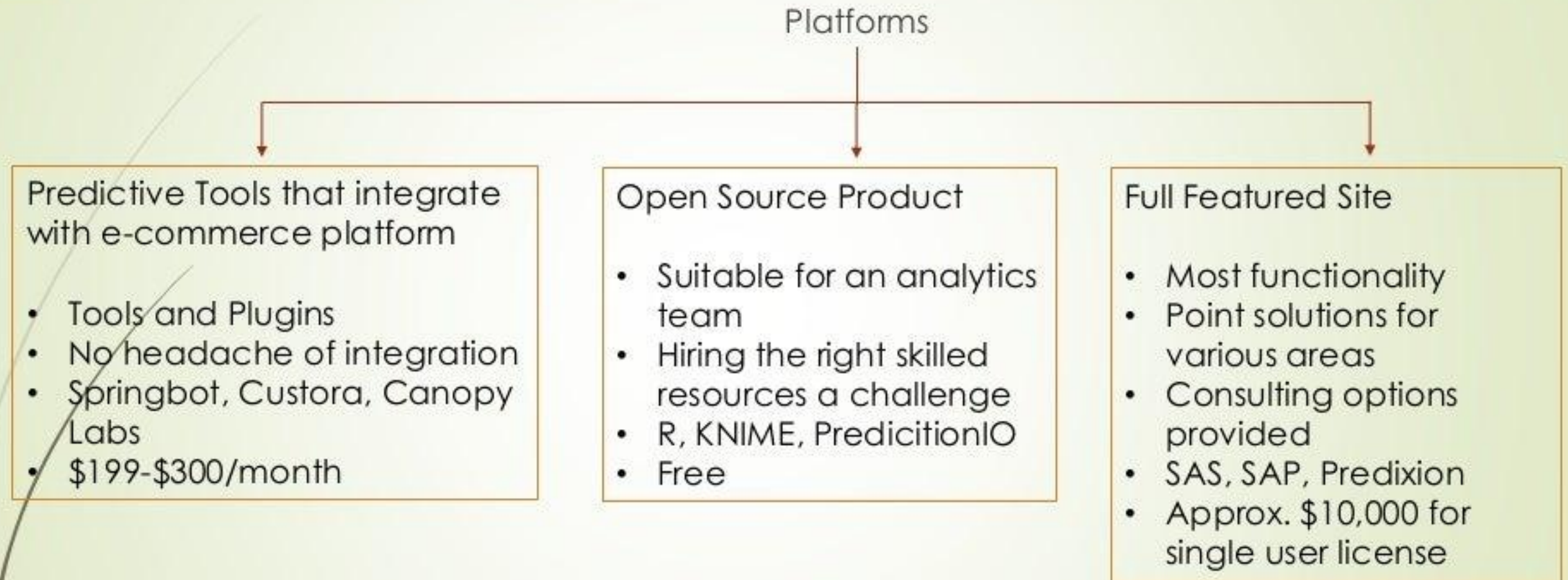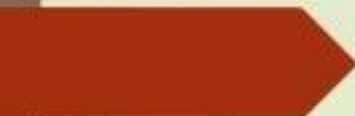
Predictive Analysis
- Used to predict consumer behavior ex. Used by Amazon to predict customer purchase
- Vendors like Atterix, SAS, Lattice provide such services

Managing Supply Chain
- Supply chain intelligence for real time communication between different stakeholders like vendors, warehouses, customer etc.
- Helps achieve faster delivery, higher fulfillment, low inventory

Platforms for Predictive Analytics

Platforms

Predictive Tools that integrate with e-commerce platform	Open Source Product	Full Featured Site
• Tools and Plugins • No headache of integration • Springbot, Custora, Canopy Labs • $199-$300/month	• Suitable for an analytics team • Hiring the right skilled resources a challenge • R, KNIME, PredicitionIO • Free	• Most functionality • Point solutions for various areas • Consulting options provided • SAS, SAP, Predixion • Approx. $10,000 for single user license

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Analytics Practices – Amazon

ATTRIBUTES	PRACTICES
In-house/ outsourced	✓ All analytics done in- house
Major Tools	✓ Open Source ✓ Tweaked to Amazon's needs ✓ Amazon uses its native analytics platform – Hadoop with Elastic Map Reduce and S3 database ✓ Amazon also uses Glacier for archiving data and Kinesis for stream processing of high volume real time data streams
Major Metrics	✓ One of the most Metrics driven company almost everything measured and evaluated
Analytics major heads	1. Customer Analytics 2. Seller Analytics 3. Trust Analytics 4. Supply Chain Analytics
Notable attributes	✓ They also monetize the platform by offering it to other companies

Customer Analytics - Amazon

PRODUCT RECOMMENDATIONS

- Hybrid Recommender Systems – a mix of both content and collaborative filtering
- Main metrics analyzed are –
  - 1) Customer's past purchases
  - 2) Items customers have rated and liked
  - 3) Purchases compared to similar purchase by other competitors
  - 4) Items in virtual shopping carts
- **Generates approximately 29% sales from recommendations**

CUSTOMER SERVICE

- No attempts to up sell over customer service calls
- Data network allows Amazon to call the customer in under a minute after he places a service request
- Reports and Views are extensively used to have selected customer information on screen
- Customers are only last name and address to fetch all their data
- **Customer service reps are well informed due to big data analytics; leads to individualized and human**

Seller Analytics - Amazon

- Amazon treats its over 2 million sellers as its customers, provide all the technology and services sellers need to run their business

- Personalization with sellers, proactive, data driven recommendations to each and every seller on the platform

- Tens of millions of recommendations to entire seller base in a day through emails and the native platform 'Seller Central'

- Business reports are also available for purchase for in depth insights

- Examples of some recommendations

1) Almost out of stock – Recommendation on how much to add to inventory based on forward looking demand for the product adjusted for seasonality and festivals

2) Search Results – When customer encounters no search results or results of low relevancy, the results are surfaced back to the seller and recommend to carry products customers are looking for

3) Fulfillment by Amazon – Recommendations based on the characteristics of how difficult the products are to fulfill

4) Performance Feedback – Metrics on satisfying customers, serving their needs and getting products to them fast and easily

5) Sharpness of Pricing – Surface up the sellers of all different products a seller is carrying on Amazon, determine whether it makes sense to lower prices for customers

Supply Chain Analytics - Amazon

- Monitors, tracks and secures 1.5 Billion items laying around 200 fulfillment centers
- 50 million updates are made to the database per week
- Entire data is crunched every 30 minutes and the results are transmitted to all the terminals

INVENTORY CONTROL

- Amazon uses 'non-stationary stochastic model' for optimizing inventory
- Has developed algorithms for joint and coordinated replenishments
- Algorithms also support fulfillment, sourcing and capacity decisions
- Forecasting is done at an SKU level for each fulfillment center

DEMAND

- Analytics on customer wish lists, gift registries and pre-orders to anticipate demand apart from usual forecasting techniques
- Wish lists are publicly visible, software crawls wish lists to aggregate data about customer demand

LOGISTICS

- Patented '**Method and System for Anticipatory Package Shipping**'
- Anticipates customer needs before they express them
- Analyzes

a) Customer Ordering History
b) Wish-lists
c) Average Shopping Cart **Content**

d) Feedbacks
e) Searches
f) How long a cursor hovers over a product page

- Results in very fast delivery, sends off packages to a shipping hub or a truck near the customer's address and waits to receive a go ahead to deliver

Control and Trust - Amazon

CREDIT CARD FRAUD DETECTION

- Uses a scoring approach to identify the most likely fraud situations
- Some of the situations analyzed are

  1) Purchase of easily resold goods on gray market such as electronics

  2) Use of different billing and shipping address

  3) Use of fastest shipping option

WAREHOUSE THEFTS

- Constantly Updates database of high ticket, most likely to be stolen items

Software Used - Flipkart

QLIKVIEW – Parent Company: Qlik, based at Pennsylvania

Improved Inventory Management tool to optimize Stock Levels

CHALLENGES

- Integrate Complex Data from disparate sources
- Deliver Analytical data to staff in various departments
- Improve inventory utilization

Initial Usage: Open source Business Intelligence (BI) but the problem faced – Scalability

ADVANTAGES

- Provided transparent and up-to-date information for analysis
- Embedded data-driven decision making at Flipkart
- Improved Inventory Utilization

Information gathered over telephonic conversation with IIM L alumnus working in Flipkart

Software Used - Flipkart

BIGFOOT - Computerized Maintenance Management Software (CMMS)

1) Managing the maintenance operational needs of organizations

2) Bigfoot CMMS' full functionality paired with its intuitive design allows to implement the solution and get results quickly

KEY FUNCTIONS

- preventive and predictive maintenance
- inventory management, work order
- asset, and equipment management
- purchasing
- built-in reporting and analysis

ADVANTAGES

- The system can support any number of facilities and multiple languages
- Increases staff productivity and reduce maintenance costs today
- Support integration with other systems like ERP, bar code, custom interfaces, advanced reporting solutions building Automation solutions, and Active Directory
- Bigfoot CMMS can be configured for different user types, security settings, site and location details, and user access settings

Analytics Practices – eBay

ATTRIBUTES	PRACTICES
In-house/ outsourced	✓ Most of the analytics done by the in- house analytics team ✓ Few practices are outsourced
Major Tools	✓ SAS ✓ Excel
Major Metrics	✓ Exit Rate, Transactional and operational metrics
Analytics major heads	1. Buyer Analytics 2. Seller Analytics 3. Trust Analytics
Notable attributes	✓ Analytics used by Marketing team for segmentation of customers or predicting churn rate for customers is handled differently ✓ AB Testing for measuring efficiency of new feature

Information gathered over telephonic conversation with IIM L alumnus working in eBay

Major Metrics - eBay

EXIT RATE

- Which is the **page which marks the termination** of user's session
- Find the **dissatisfying elements of the page** if the page is not meant for user to exit the session
- Improve the elements from pages in order **to increase the length of session** and reduce chances for abrupt end of user sessions

TRANSACTIONAL METRICS

- **Number of bought items**
- **Revenue** from bought items
- **Frequency** of transaction

OPERATIONAL METRICS

- **Conversion** from home page or search results to cart due to some features
- **Easy payment options** increasing number of sales
- **One click payment option** or reach cart at least steps
- **Customer engagement** and avoid exit rates