Courseware Design

**A. Title:**

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| Introduction to Analytics in Retail |

**B. Target Date** (to be ready)

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| August 2017 |

**C. Outline**

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| **Key topic 1** – Introduction to Analytics in Retail   * **Module Introduction** * **Sub-topic 1** – Retail Ecosystem   + **1.1** – Relationships in the retail ecosystem * **Sub-topic 2** – Analytics Journey   + **2.1** – Typical Analytics Journey * **Sub-topic 3** – Areas of Analytics in Retail   + **3.1** – 5 areas in an analytics journey * **Sub-topic 4** – Industry Standard Data Model   + **4.1** – Need for an Industry Standard Data Model   + **4.2** – The ARTS Data Warehouse Model * **Module Conclusion** * **Quiz** |

**D. Learning Objectives**

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| **S/N** | **Primary Learning Objectives** | **Enabling Learning Objectives** | **Sub-topic #** |
|  | Determine the KPIs or areas of analytics to look at, given certain goals in retail | Explain a typical analytics journey with the help of a management dashboard | 1, 2 |
|  | Describe some areas of analytics that are normally done in a retail environment | 3 |
|  | Identify an Industry Standard Data Model that retailers can use to create their own data warehouses | 4 |

**D. Design Template**

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| **A. Module Introduction** |
| Welcome to this module on the Introduction to Analytics in Retail.  Today, many retailers are constantly finding ways to draw insights from their customers’ behaviour. Analytics can be applied at every stage of the retail process, for example, retailers can   * predict trends such as what will be the top-selling products, * forecast where the demand will be, * optimize pricing, * identify the customers likely to be interested in them, * work out the best way to approach them, and what to sell them next.   **Imagine you are a retail store manager.**  How would you proceed if you want to start analytics for your retail business?  Business, Buy, Cds, Man, Market, Music, People   |  | | --- | | **Possible questions to consider**   1. **Retail Ecosystem**    * How does retailing work? Who are involved? What are the processes? 2. **Analytics Journey**  * Where does analytics in retail typically begin? Is analytics different for e-Commerce/online retail compared to a brick-and-mortar store?  1. **Areas of Analytics**    * What are some areas of analytics normally done in a retail environment? 2. **Industry Standard Data Model**    * What is an Industry Standard Data Model that retailers can use to kick start analytics? |   Let’s explore some of these questions in the next few lessons. At the end of the courseware, you should be able to begin applying analytics to retail business processes to meet specific goals!   |  | | --- | | **Learning Objectives** | | Completing this course will help you to…   * Explain a typical analytics journey with the help of a management dashboard * Describe some areas of analytics that are normally done in a retail environment * Identify an Industry Standard Data Model that retailers can use to create their own data warehouses | |

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| **B. Courseware Body** |
| **1. Retail Ecosystem** |
| **1.1 Introduction**  https://cdn.pixabay.com/photo/2016/11/28/18/18/danbo-1865615__340.jpg  **Retailing is the set of activities that markets products and services to final consumers for their own personal or household use.**  **It does this by organizing their availability on a relatively large scale and supplying them to consumers on a relatively small scale.**  Source: [Retailing: environment & operations](http://search.library.smu.edu.sg/SMU:Everything:SMU_ALMA2137737140002601) (pages 12 – 15)  To make retailing possible, an ecosystem of various participants is needed. |
| **1.2 Relationships in the Retail Ecosystem**  The figure here shows a typical **retail ecosystem**. A retail ecosystem describes the relationships between the various actors as shown below.    1 - The **Retailer** procures from the Supplier, and sells it to the Consumer.  2 - The **Supplier** provides supplies to the Retailer directly or via the Logistics Provider.  3 - The **Consumer** buys products and services from the Retailer.  4 – The **Logistics Provider** will take care of transporting the supply of goods from the Supplier to the Retailer, and from the Retailer to the Consumer.  5 - The **Finance Provider** can finance both the Retailer and Consumer. For e.g., the Consumer can buy on credit, say, interest-free with a credit card.  6 - The **Regulator** ensures that all products and services are provided according to existing rules and regulations. |
| **2. Analytics Journey** |
| **2.1 Introduction**  Man, Person, Happy, Waiter, Worker, Job, Employee  **“I’m trying to start analytics in my business.**  **Based on your experience, can you advise me which of the following areas typically happens first in an analytics journey in retail? “**  ***Select your answer, and click Done.***   1. Supply chain / Merchandising 2. Store operations / Point-of-sale 3. Customer Relationship Management 4. Corporate administration   **Done**   |  | | --- | | The correct answer is B. **Store Operations or the Point-of-Sale (POS)** is typically the first area for analytics in retail. |  |  | | --- | | I don’t think that’s quite right. Try again? | |
| **2.2 Typical Analytics Journey**  The diagram below shows how an analytics journey typically happen in retail (from left to right).    1- The first set of analytics retailers normally do are based on **Store Operations** or the **Point-of-Sale analytics** (in green).  2 - Then, retailers move on to **supply chain** and **merchandising** (in light blue).  3 - You’ll find that the **customer relationship management or CRM** comes later.  4 - Followed by areas in **corporate administration**, such as Human Resource Intelligence (in darker blue).)  **CRM versus POS**   |  | | --- | | **Q:** But why does Customer Relationship Management (CRM) come after POS in a typical analytics journey? Shouldn’t we focus on the customers first?  *Click the button for an explanation after you have come up with your own.* |   **Show explanation**   |  | | --- | | The CRM scope is to establish, grow, and retain the organization–customer relationship. The brick-and-mortar retailers do not have the means to identify all their customers to build a one-to-one relationship. Purchase data collected at point of sales (POS) can be used to summarize customer spending habits, and with loyalty and rewards programs, specific customers can be then identified. Thereafter, CRM will make better sense. However, in e-Commerce, CRM is likely to be the first step as customers cannot order without giving their details. |   **Further Reading:**   * [BSC Example – Tesco Strategy Map and Scorecard](http://www.manishabraham.com/documents/controlling) |
| **2.3 Online versus Brick-and-mortar**   |  | | --- | | **Q:** Now, think about e-Commerce/online retail vs brick-and-mortar retail store. What is one main key difference between them from an analytics perspective?  *Click the button to read about some possible differences after you have come up with your own.* |   **Show explanation**   |  | | --- | | This question expands on the earlier question of CRM versus POS.  Brick-and-mortar retailers implement loyalty and rewards programs in order to identify and collect customer data during purchases.  Another perspective: In an e-Commerce/online retail outfit, data can be collected whenever a potential customer browses their website, through the click-through. In a brick-and-mortar retail store, this is not so. There is no means to capture browsing habits of the window shopper. For example: How long did he/she stay and browse at one item?  Brick-and-mortar retailers leverage technologies like video analytics, WIFI tracking, eye ball tracking to get insights on what customers do inside the physical store. |   **Future of retail**   |  | | --- | | **Q:** Is the future of retail completely online?  *Click the button for an explanation after you have come up with your own.* |   **Show explanation**   |  | | --- | | Amazon has since opened its first brick and mortar extension – a bookstore in Seattle’s University Village. Increasingly, there is a trend towards “Omni-channel” retailing to provide customers a seamless experience from offline to online, and from device to device. “Omni-channel” customers are also said to spend more. See infographics below.    SOURCE: [retailtouchpoints.com](http://www.retailtouchpoints.com/resources/type/infographics/retail-vs-e-commerce-trends-a-match-made-in-heaven)  Hence, e-Commerce/online retail and brick-and-mortar retail store are not mutually exclusive.  **References**:   * [The future of e-commerce: bricks and mortar](https://www.theguardian.com/business/2016/jan/30/future-of-e-commerce-bricks-and-mortar) | |
| **3. Areas of Analytics in Retail** |
| **3.1 Introduction**  Let’s go deeper into 5 of the areas in an analytics journey. For each area, we will learn about some analytics that are likely to be done in a retailer problem. |
| **3.2 Areas to measure in an analytics journey**   |  | | --- | | **Market Basket Analysis** | | **Category management** | | **Inventory Intelligence** | | **Customer Analytics** | | **Marketing Analytics** |   **Market Basket Analysis**  Let’s say your goal is to increase the **basket size**, in other words, the amount of items bought by customers in one shopping trip. What areas of analytics would you measure?  Here are some possible questions and areas of analytics you could measure:    **Goal**: Monitor Buying Patterns, Increase basket size   |  |  |  | | --- | --- | --- | | Analytics | Description | Possible Question | | In basket items | Items that are part of a typical basket | What items are typically bought by which cluster/ profile? | | Attachment Rates | Analysis of what products are bought along with a base item. | Are windows cleaning products purchased when detergents are purchased? | | Brand switching | Analysis of what alternate brands would be bought by customer if the attachment brand is not available | If Coke is not available, does the customer buy Pepsi? | | Demographic basket | Analysis of typical basket of items bought by specific demographic group | How are the demographics of the neighbourhood affecting what customers are buying? |   **Category management**  If your goal is to manage assortment of your items effectively, what areas of analytics would you measure?  **Goal:** Manage assortment effectively   |  |  | | --- | --- | | Analytics | Description | | \*SKU Rationalization | Analysis of items to decide on which SKUs to store to maximize sales. SKU rationalization is a method for selecting, listing, and placing key products on the shelf. | | Share of Shelf | Analysis of share of display shelf and the impact on sales for a category | | #Assortment Optimization | Analysis to optimize the assortment of items in a category |   \* SKU stands for Stock Keeping Unit. It is a unique number assigned to a product by a retail store to identify the merchandise, and its attributes such as price, and manufacturer.  # Assortment is the different types of products that a retailer offers for sale  **Inventory Intelligence**  To determine how well you have reduced out of stocks, or streamlined your inventory, you can measure these analytics:  **Goal**: Reduce Out of Stocks, Streamline Inventory   |  |  | | --- | --- | | Analytics | Description | | Weeks of Supply | How long will the current stock on hand last based on current projected demand | | Sell Through | Indicator of sales velocity. Analysis of how much was sold versus the inventory | | Pull Through | Analysis of what other products are sold because the stores carry a specific product | | \*GMROI or Gross Margin Return on (Inventory) Investment | Analysis of sales for every dollar of inventory; used to identify which products are most cost effective to store | | Inventory Turns | Analysis of which products are fast moving |   \* GMROI is calculated as gross margin / average inventory  **Customer Analytics**  A business would want to keep its best and most valuable customers. What are some analytics if you want to measure this?  **Goal**: Keep best customers, Increase share of wallet   |  |  | | --- | --- | | Analytics | Description | | Share of wallet | Share of wallet is the current spend at household level versus the potential spend | | Segmentation | Group customers with similar characteristics – e.g. buying behavior | | Target Marketing | Identify right customer segments for marketing a product or offer | | Campaign Analysis | Analysis of results of campaign to determine whether it worked or not | | Customer Profiling | Characteristics of customer who exhibited same behavior |   **Marketing Analytics**  How do you know if your marketing efforts or promotions are achieving their targeted return on investment?  **Goal**: Manage promotions, Achieve Marketing Return On Investment (MROI)   |  |  | | --- | --- | | Analytics | Description | | Promo Lift | Increase in sales due to a promotion | | Price Points | Analysis of price points and corresponding sales, at what price points sales go up and profitable to retailer | | Channel Analysis | Analyze promotion by channel and its effectiveness | | Display Analysis | In-store, aisle and other promotions and results | |
| **4. Industry Standard Data Model** |
| **4.1 Introduction**  Let’s look at the benefits of using an industry standard data model as a reference for retailers to build their own models. We’ll go in depth into an industry standard data model that retailers and their vendors use to create their own data warehouses.  **Need for an Industry Standard Data Model**   |  | | --- | | From the analytics perspective, we typically create data models (conceptual/logical/physical) before analytics is performed. But do we need to create the model from scratch every time?  *Click the button for an explanation after you have come up with your own.* |   **Show explanation**   |  | | --- | | **No, we do not need to.** In certain industries, you do have access to a reference data warehouse model to jump start the process.  **Why do we need to look for an industry model?**  *We look for an industry model to leverage on the industry’s best practices and benchmarks, and so one does not have to reinvent the wheel every time. With benchmarks, we can also compare our KPIs & Metrics with that of competitors.* | |
| **4.2 The ARTS Data Warehouse Model**  **What is an example of an industry model for retail?**  The ARTS data warehouse is a reference model that retailers and their vendors can use to create their own data warehouses.  Some subject areas include:   |  |  | | --- | --- | | **Merchandise flow management** | **Store administration/operations** | | **Inventory management** | **Customer relationship management** | | **Item and price maintenance** | **Sales and productivity reporting** | | **Point of sale processing** | **Ordering** | | **Tender control** | **Workforce Management** |   *SOURCE: National Retail Federation, IT Standards Division: ARTS*  Read more about the [ARTS data warehouse model](https://nrf.com/arts-data-warehouse-model) here. Watch [a video on ARTS](https://youtu.be/G_dF_8vF1Hs) here. |

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| **C. Module Conclusion** |
| You have reached the end of this module.   |  | | --- | | **Can You…?**  Describe a typical retail ecosystem and identify its participants  Explain a typical analytics journey with the help of a management dashboard  Identify the various areas of analytics or KPIs to look at, given certain goals in retail  Describe an Industry Standard Data Model (e.g. the ARTS Data Warehouse Model) that retailers can use to create their own data warehouses |   **Summary**  Let’s do a quick recap.   1. Retail Ecosystem    1. Retailing is the set of activities that markets products and services to final consumers for their own personal or household use.    2. A typical retail ecosystem involves these participants: Retailer, Supplier, Consumer, Finance Provider, and Regulator.    3. The major business processes in retail include: Marketing Management, Supply Chain Management, Integrated Purchasing, and Customer Experience Management. 2. Analytics Journey    1. Analytics in retail typically begin at the point-of-sale.    2. Analytics for e-Commerce/online retail differs from that of a brick-and-mortar store, in terms of the ease and methods of data collection. 3. Areas of Analytics    1. Some areas of analytics normally done in a retail environment include Market Basket Analysis, Category management, Inventory Intelligence, Customer Analytics, and Marketing Analytics. 4. Industry Standard Data Model    1. The ARTS data warehouse is a reference model that retailers and their vendors can use to create their own data warehouses to kick start analytics. |
| **D. Quiz** |
| **Quiz**   1. If your goal is to increase the basket size, which of these areas would be appropriate to be analysed?    1. Brand switching    2. SKU Rationalization    3. Sell through    4. Price points 2. If your goal is to manage assortment of your items effectively, which of these areas of analytics would you measure?    1. Share of shelf    2. Segmentation    3. Display analysis    4. Pull through 3. To determine how well you have reduced out of stocks, or streamlined your inventory, which of these areas of analytics would you measure?    1. GMROI    2. Demographic basket    3. Channel analysis    4. Customer profiling 4. A business would want to keep its best and most valuable customers. Which of these is an area to be analysed?    1. Share of wallet    2. Weeks of supply    3. Attachment rates    4. Promo Lift 5. To analyse if your marketing efforts or promotions are achieving their targeted return on investment, which of these areas should you measure?    1. Price points    2. Inventory turns    3. In basket items    4. Target marketing |