Digital Marketing Intelligence

EBM079B05.2022-2023.1

FREE EDITION*

SUMMARY OF EVERYTHING FROM WEEK 1

LECTURES + READINGS + CHAPTERS

+ GOOGLE ANALYTICS COURSE ANSWERS

Enhanced with a dynamic table of contents.

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Grades Testimony:

COURSE CODE	TITLE	SCORE	DATE	RESULT
EBS001A10	Business Research Methods for Pre-MSc	8	21-12-2021	8
EBS002A05	Mathematics for Pre-MSc	9	10-11-2021	9
EBS003A05	Organization Theory & Design for Pre-MSc	7	05-11-2021	7
EBB098A05	Contemporary Theories on Business and Management	6	11-05-2022	6
EBB649C05	Strategic Management B&M	8	15-06-2022	8
EBB617B05	Human Resource Management B&M	8	08-04-2022	8
EBB104A05	Behavioural Decision Making	7	03-11-2021	7
EBB085A05	Marketing Research for E&BE	8	04-04-2022	8
EBS008B10	Research Paper for Pre-MSc Marketing	7	05-07-2022	7
EBM043A05	Business Ethics	8	14-11-2022	8
EBB105B05	Digital Marketing Analytics	8	21-01-2022	8
EBM213A05	Data Engineering for MADS	7	01-11-2022	7
EBM214A05	Statistical Learning in Marketing	8	02-11-2022	8
EBM215A05	Companies, Brands, and Consumers	8	05-11-2022	8
EBM216A05	Data Science Methods for MADS	9	20-01-2023 new	9

Table of Contents

Week 1

Reading 1 - R for Marketing Research and Analytics

Chapman, C., Feit, E.M. (2019). Association Rules for Market Basket Analysis. In: R For Marketing Research and Analytics. Use R!. Springer, Cham. [only pages 341-343]

Here is the link: https://doi-org.proxy-ub.rug.nl/10.1007/978-3-030-14316-9_12

Chapter 12: Association Rules for Market Basket Analysis

In the field data sets take diverse forms including products that are purchased together, services tracked over time in a CRM system, sequences of visits and actions on a Web site, and records of customer support calls. As many data points as they are, often there is relatively little information in each observation, which makes these datasets *unsuitable for simple analyses such as correlations or linear regression, because they assume near-complete measurement.*

- **Association rule mining:** a strategy to extract insight from transactions and cooccurrence data.
  - ***Association rule analysis*** attempts to *find sets of informative patterns* from large, sparse datasets.

12.1 The Basics of Association Rules

The basic idea is that when events occur **together** and **more often than expected** from their individual rates of occurrence, such co-occurrence is an interesting pattern.

- *Example:* Imagine ice-cream is sold in 5% of supermarket transactions, while sprinkles are sold in 3% of transactions.
  - If the proportion of those ice-cream sales that have sprinkles is 3%, then there is **no relationship**, because that is what we would expect from sprinkle sales from the overall data.
  - If the proportion of sprinkles sold is 25% in the ice-cream purchases then since that is quite different than the base rate (3%) we can say that is **evidence of association / relationship**.
- **Terms related to Association Rules:**
  - *Association:* the co-occurrence of two or more things
  - *Transaction:* a set of items that co-occur in an observation, e.g., the set of things that are purchased together at one time.

- *Rule:* expresses the incidence across transactions of one set of items as a *condition* of another set, or an association of some strength, e.g., { sprinkles } => { ice-cream }

➢ **Metrics:** common metrics that reflect the rules of conditional probability

- ***Support:*** the proportion of all transactions that contain the set
  - *Example:* If ice-cream appears in 10 out of 200 transactions of sprinkles, then *support({ice-cream,sprinkles})* = 0.05
  - *Note:* It does not matter if those 10 transactions contain other items, support is defined separately for every unique set of items.
- ***Confidence:*** the support for the co-occurrence of all items in a rule, conditional on the support for the left hand set alone
  - $confidence(X \Rightarrow Y) = support(X \cap Y)/support(X)$ (where "∩" means "*and*")
  - *Example:*

Consider the rule {relish} ⇒ {hot dogs}. If {relish} occurs in 1% of transactions (in other words, $support(\{relish\}) = 0.01$) and {relish, hot dogs} appears in 0.5%, then $confidence(\{relish\} \Rightarrow \{hotdogs\}) = 0.005/0.1 = 0.5$. In other words, hot dogs appear alongside relish 50% of the time that relish appears.

- ***Lift:*** the support of a set conditional on the joint support of each element
  $lift(X \Rightarrow Y) = support(X \cap Y)/(support(X)\ support(Y))$
  - *Example:*

To continue the hot dog example, if $support(\{relish\}) = 0.01$, $support(\{hotdogs\}) = 0.01$, and $support(\{relish, hotdogs\}) = 0.005$, then $lift(\{relish \Rightarrow hotdogs\}) = 0.005/(0.01 * 0.01) = 50$. In other words, the combination {relish, hot dogs} occurs 50 times more often than we would expect if the two items were independent.

When we search for rules we wish to exceed a minimum threshold on each: to find item sets that:

(1*) occur relatively frequently in transactions* (**support**) – any (0.01, 0.10, 0.20 …)

(2) *show strong conditional relationships* (**confidence**) – low (0.2) or high (0.8)

(3) *are more common than chance* (**lift**) – higher values better (above 1.0)

We use the R package `arules` to illustrate association rules

Reading 2 - Digital Marketing: a framework, review & research agenda

Kannan, P. K. and Hongshuang Li (2017). Digital marketing: A framework, review and research agenda. International Journal of Research in Marketing, 34(1), 22-45.

Here is the link: https://doi.org/10.1016/j.ijresmar.2016.11.006

Key Findings

- **Digital marketing:** an adaptive, technology-enabled process by which firms collaborate with customers and partners to jointly create, communicate, deliver, and sustain value for all stakeholders
- **The framework for research in digital marketing**

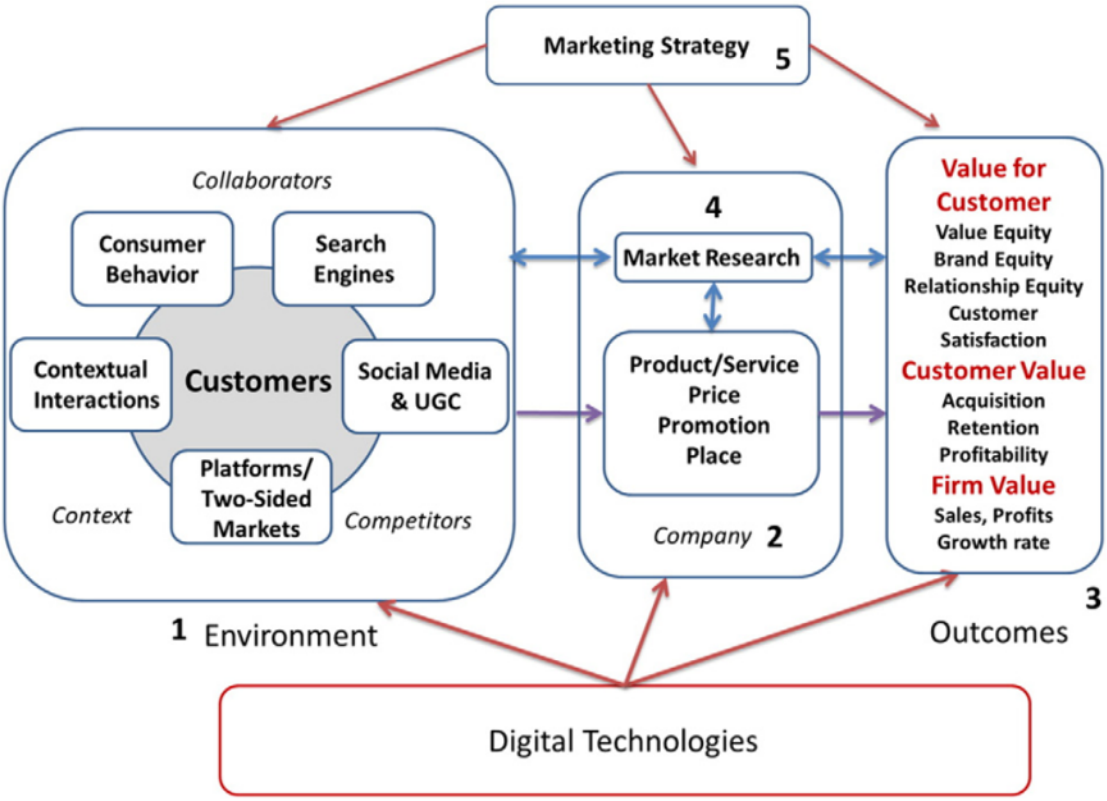


Fig. 1. The Framework for Research in Digital Marketing.

- **5 Main areas of the Digital Environment:**
  - **Consumer behavior**
  - **Social media and user-generated content**
  - **Platforms and two-sided markets**
  - **Search Engines**
  - **Contextual interactions**
    - Contextual elements that have significant impact on Digital Marketing: (1) geography and location, (2) regulations on privacy and (3) regulations against the piracy of content.

- **Marketing actions**
  - **Product:** note on digital augmentation

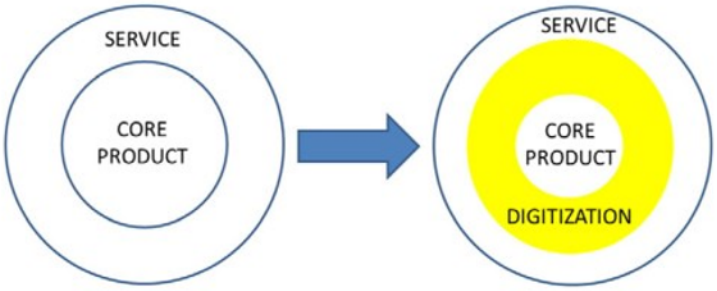


Fig. 2. Digital augmentation and transformation of product.

  - **Price:** name-your-own-pricing, freemium, subscription…
  - **Promotion**
  - **Place**

Table 1
Digital technologies and marketing environment: research issues and state-of-the art.

Area of focus	Research developments
Consumer behavior	a. Stages of buying process, purchase funnel, and impact of digital environments and digital devices b. Information acquisition, search, information processing and decision aids in digital environments c. Buyer behavior across digital and non-digital environments d. Customer trust and risk perceptions in digital environments
Social media and UGC	a. Electronic Word-of-Mouth (eWOM) and motivation for eWOM b. Dynamics in eWOM posts and their impact on sales c. How eWOM posts influence other posts? d. Social networks, identification and targeting of influencers e. eWOM and fake reviews
Platforms and two-sided markets	a. Network effects in online platforms, information asymmetry and impact on sales b. Impact of competition on two-sided content platforms c. Issues in crowdsourcing and using platforms for innovations
Search engines	a. How should search engines price and rank keywords? b. How should advertisers choose specific keywords and bid on them? c. Relationship between rank, click-through rate and conversion rate, and decision support for optimal bidding d. Synergy between organic search and paid search
Contextual interactions	a. Interaction between geography/location and digital environments b. Impact of regulatory environment - Privacy concerns and effectiveness of digital marketing c. Impact of piracy of content

Reading 3 - A model of online shopping cart abandonment

Kukar-Kinney, M., Scheinbaum, A. C., Orimoloye, L. O., Carlson, J. R., & He, H. (2022). A model of online shopping cart abandonment: evidence from e-tail clickstream data. Journal of the Academy of Marketing Science, 1-20.

Here is the link: https://link.springer.com/article/10.1007/s11747-022-00857-8

Online Shopping Cart Abandonmnet Literature & Lit. Gap

Article	Method	Cart Use	Mobile Device	Click-stream Data	Focus and Key Findings
The current research	Field study	✓	✓	✓	**Behavioral aspects of online abandonment representing purchase, economic control, organization, and information motivations**. Drivers of greater cart use include: having an existing cart, number of sold-out items seen, visiting clearance page, number of product reviews accessed, and using a smartphone. Number of products seen reduces cart use. Shopping on a smartphone (vs. other devices) moderates these relationships. Predictors of higher cart abandonment are: visiting clearance page, removing items from the cart, number of products and customer reviews seen. Having an existing cart and extensive cart use reduce abandonment.
Li et al. (2021)	Field experiment	–	✓	✓	**Retargeting in electronic cart abandonment**. Examines causal effectiveness of retargeting abandoned carts. E-commerce cart retargeting ads bring "double-edged" incremental effects on purchasing. A cart retargeting ad sent late has a positive incremental effect; an ad sent early brings a negative effect. Effects are amplified with an above average price and larger quantity of products.
Rubin et al. (2020)	Experiment	–	–	–	**Role of consumers' temporal framing in online shopping cart abandonment**. An abstract mindset will lead to a positive intention to purchase products in a cart. Peripheral features in the product description moderate this effect. With positive peripheral attributes, the negative effect of abstract mindsets on abandonment is reduced. Involvement moderates the path from construal to number of product features.
Song (2019)	Survey	–	–	–	**Product categorization in online cart abandonment**. Price, symbolic value, perceived importance, and purchase frequency impact abandonment through motivations for shopping activities (e.g., product inspection).
Huang et al. (2018)	Survey	–	✓	–	**Conflicts, ambivalence and hesitation in mobile cart abandonment**. Consumers experience tension between completing or not completing a shopping task while considering making a purchase. Conflicts about product attributes determine emotional ambivalence. Ambivalence leads to hesitation and abandonment.
Xu & Huang (2015)	Survey	–	–	–	**Determinants of cart abandonment in China**. Results replicate the role of organization and research motive on abandonment and the role of concern about costs from Kukar-Kinney and Close (2010).
Close et al. (2012)	Conceptual	✓	–	–	**Consumer electronic shopping behavior**. Conceptually, cart abandonment, frequency of online buying, and decisions to buy from a land-based retailer depend on: cost concern, entertainment value, organizational intent, taking advantage of a price promotion, current purchase intent, cart use, and privacy/security concerns.
Kukar-Kinney and Close (2010)	Survey	✓	–	–	**Determinants of cart abandonment**. Determinants include: entertainment value, use of the cart as a research and organizational tool, concern about costs, and waiting for a sale or price reduction.
Close and Kukar-Kinney (2010)	Survey	✓	–	–	**Hedonic and utilitarian motivations in online cart use**. Cart use is explained by current purchase intent, taking advantage of price promotion, entertainment purposes, organizational intent, and research and information search. Frequency of online shopping cart use then leads to frequency of online buying.
Rajamma et al. (2009)	Survey	–	–	–	**Factors leading to propensity to abandon a cart during the transaction completion stage**. Perceived transaction inconvenience is a driver of abandonment. Consumer perception of waiting time, risk also drive cart abandonment. As perceived waiting time increases, incidence of shopping cart abandonment decreases.
Moore and Mathews (2008)	Qualitative	–	–	–	**Online shopping cart abandonment syndrome**. Perceived performance risk via extrinsic cues (e.g., price) determine performance evaluation, while company's reputation explains frequently abandoned carts.
Cho et al. (2006)	Survey	–	–	–	**Shopping cart hesitation and abandonment**. Three types of online shopping hesitation are overall hesitation, shopping cart abandonment, and hesitation at the final payment stage.
Oliver and Shor (2003)	Experiment	–	–	–	**Role of promotion codes**. The effect of digital redemption of promotion codes on online purchase abandonment is studied. When a consumer does not have a coupon code, it is perceived as inequality, driving noncompletion intentions of a hypothetical purchase as a proxy for cart abandonment.

Key Findings

Main effects on online shopping cart abandonment

- Having an **existing cart** has a negative relationship with cart abandonment
  - Consumers who started the shopping session with an existing cart are less likely to abandon their cart than other consumers.
- Visiting the **clearance page** is positively associated with cart abandonment
- **Removing item(s)** from the cart is positively associated with cart abandonment
- Positive association between both the **number of products seen** and cart abandonment as well as between the **number of product reviews accessed**.
  - Customers who conduct a more extensive search of retailer-provided or consumer-provided information have a higher likelihood of cart abandonment

Moderating role of smartphone-based shopping on online shopping cart use

- Having an **existing cart** has a more positive relationship with cart use when shopping on a smartphone (vs. other devices).
- Visiting **clearance page** is more positively associated with cart use when shopping on a smartphone (vs. other devices).
- **Number of products seen** and device type positively interact to impact cart use. In response to an increased number of products seen, cart use increases to a greater degree for a smartphone (vs. other devices)
- Positive interaction of device type and **number of sold-out items** on cart use.
  - Cart use when seeing sold-out items is greater when shopping on a smart- phone (vs. other devices).
- **Number of product reviews seen** and device type exert a neg- ative interaction (−.307, $p < .01$) on cart use.
  - Cart use when seeing an increased number of customer reviews is lower for consumers shopping on a smartphone (vs. other devices).
- Finally, recall that moder- ating relationships on cart abandonment were not expected or formally proposed, but they were controlled for in the model. Only the interaction between device type and having visited a clearance page is significant (−1.294, $p < .001$), **providing evidence for a less important role of device type on cart aban- donment vs. cart use.**

Reading 4 – Path to Purpose? How online Customer Journeys Differ…

Li, J., Abbasi, A., Cheema, A., & Abraham, L. B. (2020). Path to Purpose? How Online Customer Journeys Differ for Hedonic Versus Utilitarian Purchases. Journal of Marketing.

Here is the link: https://journals.sagepub.com/doi/pdf/10.1177/0022242920911628

Key Managerial Implications

Hedonic products

- Retailers selling hedonic products such as toys, we provide two actionable insights: (1) embrace **social media** and (2) monitor on-site product page views.
    - Social media is being used extensively throughout the customer journey and is increasingly becoming a channel for proactive information search (eMarketer 2017)
    - Managers should consistently invest in social media marketing to entice more consumers to visit their websites
- There is a potential **guilt-justification need** for consu- mers who failed to complete hedonic purchases.
    - Because social media is extensively used at the beginning of the journey, retailers could deploy social coupons with features that serve both the experiential and justification needs of hedonic purchases (Kumar and Rajan 2012)
- Given the affective nature of hedonic purchases, retailers should constantly **improve the experiential features of the product pages** on their sites to convert more hedonic purchases.
- Retailers can monitor their page views and reach out to **heavy browsers** with promotions with a longer redemption time (e.g., two weeks)

Utilitarian products

- Retailers selling utilitarian products such as office supplies, we offer two prescriptions: (1) benchmark price and product and (2) prioritize search engine marketing (SEM).
- Consumers tend to optimize their utilitarian purchase by visiting third-party review sites, exploring deal sites, and browsing product pages on competing retailers' sites.
    - Retailers should employ price and product benchmark analysis to understand whether their price is above or below the market price and what potential customers see and experience when searching for similar products.

- Given the rise of competitive intelligence, managers could invest more in automated benchmarking tools to monitor, listen, and analyze the key competitive metrics (e.g., price, live deals, Yelp reviews) in real time.

- Retailers should **prioritize SEM** over search engine optimization. In addition, they should choose paid keywords that are more related to product features and benefits, provided that utilitarian purchases usually involve more product comparisons.

Black Friday & Cyber Monday

- Retailers *selling hedonic products* could market their promotional content on **social media** and send **reminder emails** inviting on-site traffic two weeks before Black Friday, when their customers start to engage in social media and on-site product pages.
- Retailers *selling utilitarian products* could **extend their sales** because consumers start to visit deal sites one week before they make purchases. In addition, they could **optimize their SEM strategy** during Black Friday or Cyber Monday to enhance the conver- sion rate.

Conclusion

- Consumers *making hedonic purchases* seek fun, enjoyment, and pleasure in their shopping process; prefer social media; and are more likely to browse product pages on the target retailers' website.
- Consumers making utilitarian purchases prefer channels that facilitate convenient and efficient search across alternatives. Therefore, they prefer leveraging search engines, reading more reviews on the third-party review sites, comparing prices on deal sites, and browsing Li et al. 143 more product pages on competing retailers' websites than hedonic purchasers.

Reading 5 - Online display advertising for CPG brands…

Van Ewijk, B. J., Stubbe, A., Gijsbrechts, E., & Dekimpe, M. G. (2021). Online display advertising for CPG brands:(When) does it work?. International Journal of Research in Marketing, 38(2), 271-289.

Here is the link: https://doi.org/10.1016/j.ijresmar.2020.08.004

Key Findings

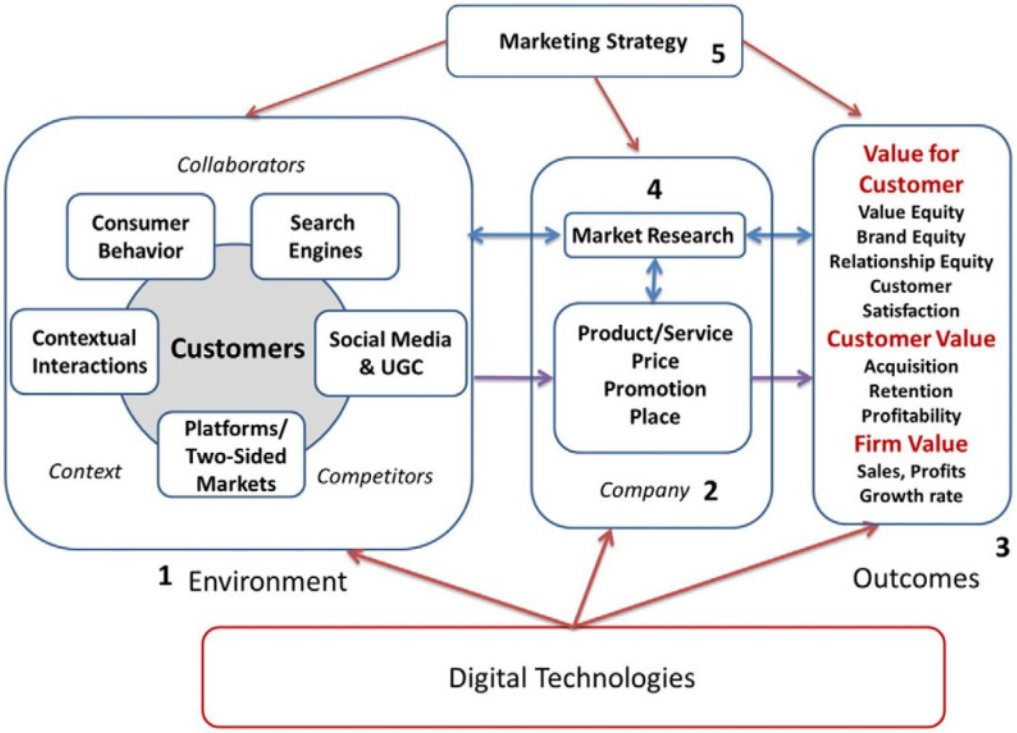
- For the average CPG (Consumer Packaged Goods) brand, unlike TV (and, to some extent, print) advertising, **display ads** by themselves do not exert a significant impact on brand sales, in the short nor the long run.
  - Even within a multi-media setting, display ads are not guaranteed to enhance sales for the typical CPG brand.
- There is a significant subset of brands for which display ads do enhance (long-term) brand sales:
  - Display ads do not lift sales for low-involvement utilitarian products.
  - Display ads can lead to a significant increase in brand sales in high-involvement categories. For high- involvement products that are hedonic in nature, display advertising works best in combination with other media. May be because combining display advertising and traditional-media results in higher levels of attention (Chang & Thorson, 2004)
- Display-advertising elasticities are higher when investments in the medium are not pulsed, but more evenly spread in time. This appears consistent with the observation that display ads are less subject to tedium and wearout, and can play a role in multiple stages of the purchase funnel, i.e., in creating awareness, maintaining brand salience, and activating consumers to buy (Batra & Keller, 2016).

Lecture 1: Digital Analytics & Cross Media Campaigns

Digital Marketing

"Formal" definition: An adaptive, technology-enabled process by which firms collaborate with customers and partners to jointly create, communicate, deliver, and sustain value for all stakeholders.

Digital Marketing Framework



- **New data, old problems:** with new data sources coming into play, we get to test our old theories and marketing questions in a new way prompting a confirmation of our previous beliefs or generating new insights.
- **New data, new problems**

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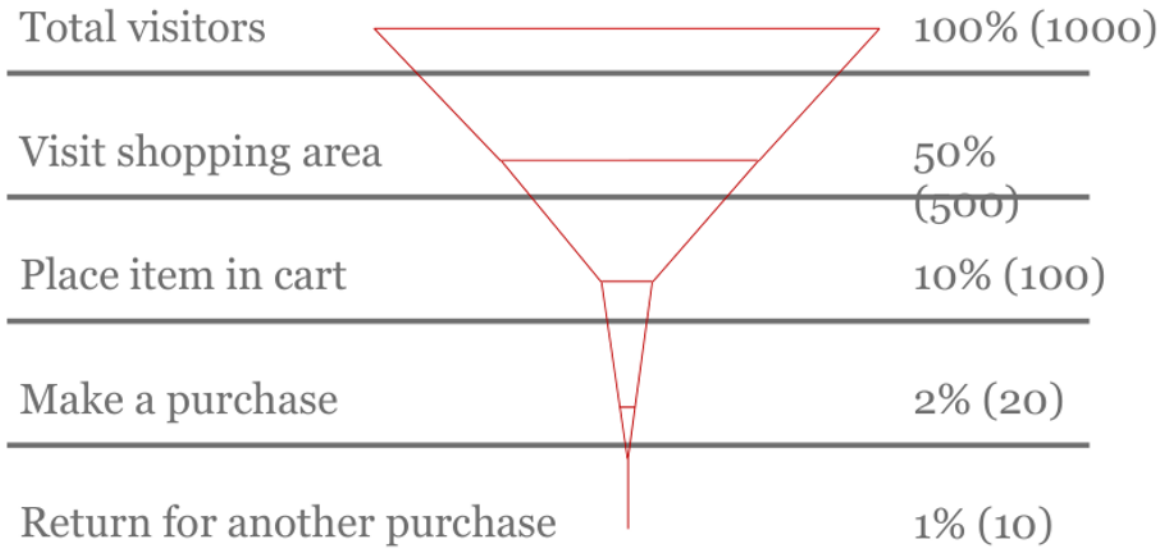
Clickstream data

Clickstream data are defined as the electronic record of Internet usage collected by Web servers or third-party servers (Bucklin & Sismeiro, 2009).

There are two types of *clickstream data:*

- **Site-centric:** detailed records of what visitors do when navigating and interacting with a ***specific site***
  - Offline = compare loyalty card information of one specific store
- **User centric:** detailed records of online behavior tracing ***across sites***
  - Offline = scanner data of specific consumer products

Basic Analysis: The Website Funnel



From measurement to basic insight for an online store

Measurements

- 1000 Visitors
- 500 Visit shopping area (Shoppers)
- 100 Place item in cart (Pickers)
- 20 Make a purchase (Buyers)
- 10 Return for another purchase (Returners)

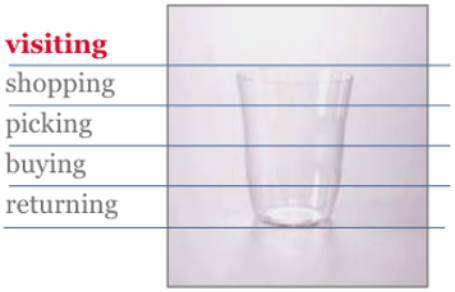
Insights

Metric	Formula (x 100%)	Outcome
Conversion	Buyers/Visitors	(20/1000) x 100% = **2%**
Stickyness landing page	Shoppers/Visitors	(500/1000) x 100% = **50%**
Relevance of the content	Pickers/Shoppers	(100/500) x 100% = **20%**
Checkout effectiveness	Buyers/Pickers	(20/100) x 100% = **20%**
Loyalty	Returners/Buyers	(10/20) x 100% = **50%**

3 Different Conversion Funnel Shapes

The worst funnel

No traffic to the site



The almost perfect funnel

Conversion OK
No returns

The perfect funnel

3 Types of analyses

- **(1) Browsing** and site usage behavior on the internet/apps
  - *Engagement*
- **(2) Shopping** behavior on the Internet
  - *Conversion*
- **(3) Advertising:** the internet's role and efficacy as a medium for persuasion

(1) Browsing & Site Usage Behavior

Different sites have different purposes:

- **Speed up process:** e-commerce sites might want to speed up the process between visiting to purchasing
  - Decrease the visit duration
  - Learning effects relevant: *optimize the website in a way that when people come back to the site they learn and end up being able to navigate the site better and faster every time.*

- *Ngwe et al. 2019:* looked at what happens when you actually change up your website UI like they do in physical stores when they change the layout.

➢ **Slow down process:** entertainment and media websites/platforms may want to keep you on the site for longer

- Increase duration visit

Some insights from the literature:

➢ Initial findings

› Sites visits and visit duration

- More frequent visits → visit duration decreases (Johnson, Bellman, and Lohse 2003)
- Learning?
  - Fewer page views or shorter visits?
- Fewer page views, not less time spent viewing each page (Bucklin and Sismeiro 2003)

➢ **Newer findings:** Kukar-Kinney, M., Scheinbaum, A. C., Orimoloye, L. O., Carlson, J. R., & He, H. (2022). A model of online shopping cart abandonment: evidence from e-tail clickstream data. Journal of the Academy of Marketing Science, 1-20.

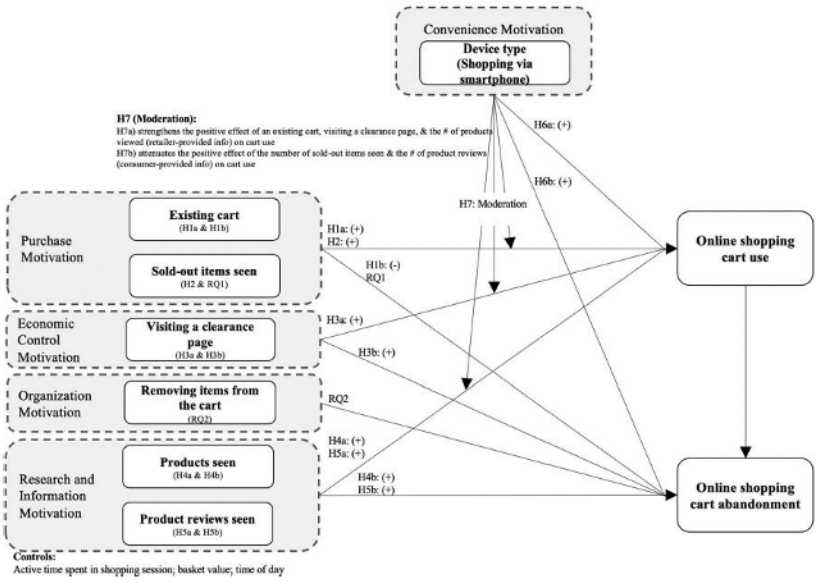


Fig. 1 Uses and gratifications theory based model of online shopping cart use and cart abandonment

- They looked at why cart abandonment happens, while accounting for cart use, what device was used and so on.

- **Endogeneity concerns – self selection bias:** in this study people chose what device they use themselves, which leads to self-selection bias.
  - ***Possible solution:*** Propensity Score Matching (PSM)
    - **Step 1:** use a logistic regression for smartphone used yes/no
    - **Step 2:** calculate propensity/probability scores for each individual
    - **Step 3:** find a *statistical twin* for each smartphone user (i.e. a customer that has the same probability to use a smartphone, but did not use one). So you compare these users who did and didn't use a smartphone but had the same probability to use it, because we assume they are similar to each other and makes the study better.
- **Models** in the study
  - **DV1: Cart Use**
    - For this DV they used a **random effects Zero-Inflated Poisson regression model**
      - **Why Poisson model?** If you have a count variable you use this model
      - **Why zero-inflated?** Because this dataset had a lot of 0s, so this type of model accounts first for the number of 0s and then tries to explain the non-zero values.
      - **Why random effect?** As a regression model assumes a degree of similarity between the observations, due to the fact we're all different and this does not fit this assumption, we need to run this random effects variation of the model.
  - **DV2: Cart abandonment**
    - For this DV they used a **Conditional Logistic regression model**
      - **Why logistic regression?** Because we are dealing with a binary DV
      - **Why conditional?**
- **Key Insights** (Intuition to reading results table of a model)
  - Step 1: Look at the **significance of the effect** (p-value), only interpret those which are significant (< .05)
  - Step 2: Is the value positive or negative (**direction of effect**)

- Step 3: What is the number and what does it mean? Based on the type of regression model that we estimated. (**size of effect**)

Table 5 Random effect models for zero-inflated poisson regression model results for # products in cart and random effects models for conditional logit model results for online shopping cart abandonment (standardized regression coefficients)

H	Variable	DV: Cart use			DV: Cart abandonment		
		Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
	Log(Cart use)					−0.372*** (0.025)	−0.376*** (0.026)
	Log(Cart use) X Device type						−0.015 (0.199)
H1 a, b	Existing cart		0.196***(0.022)	0.194***(0.005)		−0.624***(0.111)	−0.634***(0.112)
	Existing cart X Device type			0.043***(0.174)			−2.399(1.605)
H2 RQ1	log(Sold-out items)		0.083***(0.001)	0.079***(0.009)		0.085(0.055)	0.085(0.056)
	Log(Sold-out items) X Device type			0.693***(0.170)			−0.821(0.224)
H3 a, b	Clearance page		0.029***(0.023)	0.021***(0.022)		0.422***(0.118)	0.409***(0.119)
	Clearance page X Device type			0.190***(0.179)			−1.294***(1.247)
RQ2	Cart removal	N/A	N/A	N/A		0.371**(0.106)	0.370**(0.106)
	Cart removal X Device type			N/A			1.193(1.781)
H4 a, b	log(Products seen)		−0.453***(0.020)	−0.459**(0.021)		0.672***(0.095)	0.685***(0.096)
	log(Products seen) X Device type			0.629***(0.134)			−0.354(0.836)
H5 a, b	log(Product reviews)		0.027***(0.013)	0.026***(0.013)		0.117**(0.072)	0.115**(0.072)
	log(Product reviews) X Device type			−0.307***(0.129)			0.655(0.35)
H6 a, b	Device type		0.069***(0.082)	1.186***(0.005)		−1.184(0.537)	−2.292(1.074)
	Constant	−15.16***(0.029)	−6.916***(0.246)	−6.913***(0.247)	−9.52***(0.085)	−4.043***(1.119)	−4.100***(1.122)
	Control variable 1: log(Active sec spent)	1.144***(0.002)	0.487***(0.019)	0.486***(0.019)	0.629***(0.006)	0.391***(0.089)	0.396***(0.089)
	Control variable 2: Time variable (Dummies)	Included	Included	Included	Included	Included	Included
	Control variable 3: log(Cart value)	*N/A*	N/A	N/A	0.059*** (0.006)	−0.364*** (0.067)	−0.366*** (0.068)
	BIC	*753,520.6*	*27,017.46*	*17,027.85*	*135,443.3*	*8981.414*	*3030.614*
	Log-likelihood	*−376,740.6*	*−9471.87*	*−8456.586*	*−67,698.01*	*−2743.623*	*−1440.757*

**p < .05, ***p < .01 (two-sided); N = 78,232

(2) Shopping Behavior

Understanding conversion, path to purchase and the customer journey.

- **Customer journey:** a series of actions a customer takes to arrive at the moment of purchase (Li et al. 2020, p. 127).
- **Path to Purpose (Li et al. 2020)**
  - Their **research questions** were:
    - Do consumers use digital information channels differently for H/U purchases?
    - How does this usage vary over the customer journey?
    - Does this usage vary between converted and unconverted sessions?
  - **Model:** "A hierarchical Bayesian approach to consider channel interdependency, retailer, product, and individual heterogeneity in online information channel usage" (p. 128)

Market Basket Analysis

The goal is finding pairs of products that are jointly observed in large samples of baskets.

- **Use:** cross-selling, recommendations, and product bundling
- **3 Important Elements of MBA:**
  - **Support:** joint probability of finding pair AB across all baskets
  - **Confidence:** probability of a purchase of B given a purchase of A
  - **Interest:** discounts the joint probability by the popularity of the individual products

➡ For association rules to be relevant, all three elements must be passing a threshold. Thresholds are context-dependent.

(3) The Internet's Role: Advertising and Persuasion

Two possible functions of the Internet in research is to: (1) measure advertising effectiveness and (2) using it itself as an advertising medium.

(1) Internet used to measure advertising effectiveness

- **Banner advertising/display may:**
  - Create brand awareness
  - Serve as a reminder
  - Activate consumer to buy
  - Serve brand building (long term impact)
- **Impact of banner advertising depends on:**
  - Consumer, Design, Device, Combination with other media, Product type (hedonic, utilitarian, high/low involvement), Brand, Timing…
- **Paid search: ads shown based on search terms**
  - Place of the ad: top of the page, side of the page
  - Auctions: place of the ad (the rank) is based on the bid you make, optimization algorithms

(2) Internet used as an advertising medium

- **Multimedia campaigns, why?**
  - Number of media is increasing
  - Fragmentation: not all consumers reached through one medium
  - Not all media are equally effective – combining media may change the total effect

- There may be **synergistic effect** (media strengthen each other's' effects) or **antagonistic effect** (media may weaken each other's effect).

➢ **Integrated Marketing Communications needed**

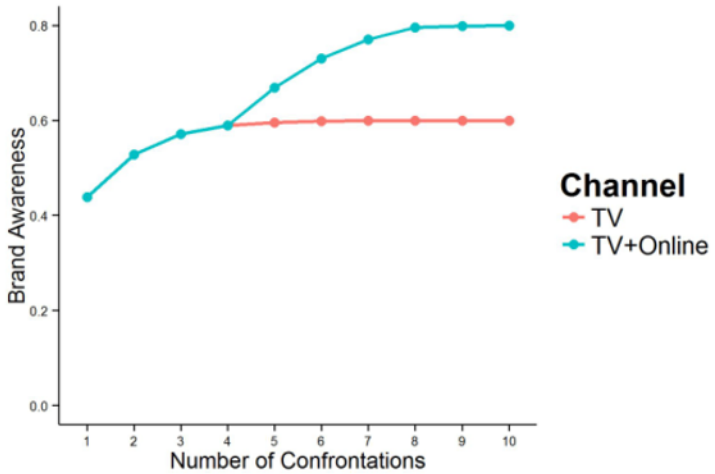
- Conflicting messages from different sources or promotional approaches can confuse company or brand images.
  - Deliver a clear, consistent, and compelling message about the organization and its products.
- Best bet is to wed traditional branding efforts with the interactivity and service capabilities of online communications.
- Ordering; for example, a consumer remembers the visual aspects of the TV commercial when listening to the radio commercial later.

➢ **Differences between media**

- Different **moment**
  - *Radio*: in the car, at work
  - *TV*: at home
  - *Internet*: at home and at work
- Different **part** of the message
  - *Radio:* core of the textual message, slogan
  - *TV:* core of the visual message
  - *Internet:* detailed information about the product, brand…
- Different **impact** of the consumer
  - *Radio and TV:* external pacing
  - *Print, internet:* internal pacing (consumer decides)

➢ **Wear out effect:** message needs to be repeated, but the effect decreases as the frequency of exposure grows.

- **Combining media** means less wear out



Google Analytics Course (depreciated – Universal Analytics)

Note: this section has depreciated due to Google moving from Universal Analytics to Google Analytics 4.

Assessment 1 Answers:

1. Using tracking code, Google Analytics can report on data from which systems?

(select all answers that apply)

Correct!

- [x] E-commerce platforms
- [x] Mobile Applications
- [x] Online point-of-sales systems
- [ ] Systems not connected to the Internet

2. To collect data using Google Analytics, which steps must be completed?

(select all answers that apply)

Correct!

- [ ] Install Google Analytics desktop software
- [x] Create an Analytics account
- [x] Add Analytics tracking code to each webpage
- [ ] Download the Analytics app

3. The Analytics tracking code can collect which of the following?

(select all answers that apply)

Correct!

- [x] Language the browser is set to
- [x] Type of browser
- [ ] User's favorite website
- [x] Device and operating system

4. When will Google Analytics end a session by default?

Correct!

- ( ) After 30 minutes, regardless of user activity on your website
- ( ) Once the user opens another browser window
- (•) When a user is inactive on your site for 30 minutes or more or closes a browser window
- ( ) At noon every day

5. Once Google Analytics processes data, it's stored in a database where it can't be modified.

Incorrect - review Unit 1, Lesson 2

- ( ) True
- (•) False

6. Which represents the hierarchical structure of a Google Analytics account from top to bottom?

Correct!

- ( ) View > Account > Property
- ( ) Property > Account > View
- ( ) Account > View > Property
- (•) Account > Property > View

7. A user with "edit" permissions at the Account level will automatically have "edit" permissions at which other levels?

(select all answers that apply)

Correct!

- [ ] User
- [x] Property
- [x] View
- [ ] Product

8. To locate a property's Analytics tracking code, which sequence of steps should be followed?

Correct!

- Admin > Tracking Code > Tracking Info
- (•) Admin > Tracking Info > Tracking Code
- Reports > Audience > Tracking Code
- Audience Reports > Settings > Tracking Code

9. To use Analytics to collect website data, what must be added to the website page HTML?

Correct!

- Google campaign parameters
- Google Analytics terms and conditions
- (•) Google Analytics tracking code
- A permissions button

10. Where should the Analytics tracking code be placed in the HTML of a webpage to collect data?

Correct!

- (•) Immediately after the opening <head> tag of your website
- Immediately before the closing </head> tag of your website
- Immediately after the opening <body> tag of your website
- Immediately before the closing </body> tag of your website

11. When a new view is created, what data will be included?

Correct!

- Data from before the view was created
- (•) Data from after the view was created
- Data from before and after the view was created
- No data

12. A deleted view can be recovered by account administrators within how many days?

Correct!

- (•) 35
- 65
- 95
- 125

13. What are the options for filtering data in Google Analytics?

Correct!

- Exclude data from a view
- Include data in a view
- Modify how data appears in your reports
- (•) All of the above

14. Why is it important to keep one unfiltered view when using filters with Google Analytics?

Correct!

- (•) To ensure you can always access the original data
- In order to configure Goals
- In order to use a filter for multiple views
- There is no reason to have an unfiltered view

15. In which order does Google Analytics filter data?

Correct!

- Alphabetical order by filter name
- The order in which the filters were last edited
- (•) The order in which the filters are applied
- Randomized order

16. When a filter is applied to a view, what data is affected?

Correct!

- Data from before the filter was created
- (•) Data from after the filter was created
- All the data available in a view
- None of the data available in a view

Assessment 2 Answers:

1. What feature would be used to compare two date ranges in a report?

Correct!

- Hourly, Day, Week, Month views in the time graph
- Real-time reports
- Date range comparison
- Account selector

2. What does the "Users" metric measure?

Correct!

- The total number of visits to your website
- Users that had at least one session on your site in the given date range
- Users that landed on the homepage of your website
- Users who have signed up to an email newsletter on your website

3. What is the "Bounce Rate" in Google Analytics?

Correct!

- The number of times unique users returned to your website in a given time period
- The percentage of sessions in which a user exits from your homepage
- The percentage of total site exits
- The percentage of visits when a user landed on your website and exited without any interactions

4. What is a "dimension" in Google Analytics?

Correct!

- The total amount of revenue a business has made in a given date range.
- An attribute of a data set that can be organized for better analysis.
- A comparison of data between two date ranges.
- A report that offers information about your audience.

5. What is a "metric" in Google Analytics?

Correct!

- A dimension that can help you analyze site performance.
- The dates in your date range.
- A segment of data separated out in a report for comparison.
- The numbers in a data set often paired with dimensions.

6. What is a "secondary dimension" in Google Analytics?

Correct!

- An additional widget you can add to a dashboard for more specific analysis.
- An additional metric you can add to a report for more specific analysis.
- An additional dimension you can add to a report for more specific analysis.
- A visualization that allows you to understand the impact of your data.

7. Which Google Analytics visualization compares report data to the website average?

Correct!

- Pivot view
- Comparison view
- Performance view
- Percentage view

8. How can the amount of data in a sampled Google Analytics report be increased?

Correct!

- Apply additional filters
- Remove the Secondary Dimension
- Choose "Faster response" in the sampling pulldown menu
- Choose "Greater precision" in the sampling pulldown menu

9. When selecting "Share Template Link" in the dashboard, what will be shared?

Incorrect - **review** Unit 2, Lesson 5

- Dashboard only
- Data only
- Dashboard and data
- Neither dashboard nor data

10. When a dashboard is shared with a user, that user can edit the dashboard configuration as they see it.

Correct!

- True
- False

Assessment 3 Answers

1. What setting must be enabled to view data in Demographics and Interests Reports?

Correct!

- Content Grouping
- Advertising features
- User permissions on the view
- In-Page Analytics

2. What report would best help identify potential browser issues with website traffic?

Correct!

- The Active Users report
- The New vs Returning report
- The Browser & OS report
- The Source/Medium report

3. What report shows what mobile devices were used to view a website?

Correct!

- The Exit Pages report under "Site Content"
- The Landing Page report under "Site Content"
- The Engagement report under "Behavior"
- The Devices report under "Mobile"

4. Which Traffic Source dimensions does Google Analytics automatically capture for each user who comes to your site?

Correct!

- Source, Keyword, Campaign name
- Source, Medium, Keyword
- Source, Medium, Campaign name
- Medium, Keyword, Campaign name

5. Which "sources" are available in Google Analytics?

(select all answers that apply)

Correct!

- [x] googlemerchandisestore.com
- [ ] Email
- [x] Google
- [x] (direct)

6. Which "mediums" are available in Google Analytics?

(select all answers that apply)

Correct!

- [x] organic
- [x] cpc
- [ ] mail.google.com
- [x] referral

7. Which "channels" are available in the default Channels report?

(select all answers that apply)

Correct!

- [x] Organic Search
- [ ] Device
- [x] Display
- [x] Direct

8. What report can show how particular sections of website content performed?

Correct!

- Location
- Content Drilldown

9. What report lists the website pages where users first arrived?

Correct!

- Events > Pages
- All Pages
- Exit Pages
- Landing Pages

10. What report should be used to check if users are leaving from important pages on your website?

Correct!

- Landing Pages report
- All Pages report
- Exit Pages report
- Pages report under Events

Assessment 4 Answers

1. Which three tags does Google Analytics require for accurate campaign tracking?

Correct!

- ○ Medium, Source, and Content
- ◉ Medium, Source, and Campaign
- ○ Campaign, Content, and Term
- ○ Source, Content, and Term

2. Which tags are standard Google Analytics campaign parameters?

(select all answers that apply)

Correct!

- ☐ utm_adgroup
- ☑ utm_source
- ☑ utm_medium
- ☑ utm_content

3. To quickly generate campaign tags, what tool should be used?

Correct!

- ○ The Measurement Protocol
- ○ The Segment Builder
- ◉ The URL Builder
- ○ The Goal Selector

4. Which formats may be used to add a custom campaign parameter to a URL?

(select all answers that apply)

Correct!

- ☐ www.googlemerchandisestore.com/?utm campaign = fallsale
- ☑ www.googlemerchandisestore.com/?utm_campaign=fallsale
- ☑ www.googlemerchandisestore.com/?utm_campaign=fall_sale

5. Which are examples of Goals in Google Analytics?

(select all answers that apply)

Correct!

- ☑ Making a purchase
- ☑ Signing up for a newsletter
- ☐ Completing a successful Google search
- ☑ Submitting a contact information form

6. When creating a Goal in Google Analytics, which are required?

(select all answers that apply)

Correct!

- ☑ Goal Name
- ☑ Goal Type
- ☑ Goal Slot ID
- ☐ Goal Funnel Visualization

7. If the Google Merchandise Store sets up a URL goal of "/thankyou" and a Match Type of "Begins with", which of the following pages on www.googlemerchandisestore.com will count as goals?

Correct!

- ○ /thankyou.html
- ○ /thankyou.php
- ○ /thankyou/receipt.php
- ◉ All of the above

8. Google Ads lets users advertise on which properties?

(select all answers that apply)

Incorrect - review Unit 4, Lesson 4

- ☑ Google Search
- ☑ Google Display Network
- ☐ Campaign Manager
- ☑ Google AdSense

9. Enabling auto-tagging does what?

Correct!

- ○ Adds Analytics tags to campaign URLs
- ◉ Adds Google Ads tags to campaign URLs
- ○ Adds campaign hyperlinks to website pages
- ○ Adds Analytics tracking code to website pages

10. What Google Ads report in Google Analytics can show which bid adjustments resulted in higher conversions?

Correct!

- ○ Campaigns
- ○ Keywords
- ◉ Bid Adjustments
- ○ Destination URLs