Data Science and Machine Learning Approach to Improve E-Commerce Sales Performance on Social Web

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Abstract

E-Commerce is a buzzword well known for electronic commerce activities including but not limited to the online shopping, digital payment transactions, and B2B online trading. In today's digital age, e-commerce has been playing a very important and vital role in areas such as retail shopping, sales automation, supply chain management, marketing and advertisement, and payment services. With a huge amount of data been collected from various e-commerce services available, there are multiple opportunities to use that data to analyze graphs and trends. Strategize profitable activities, and forecast future trade. This paper explains a contemporary approach for collecting key data metrics and implementing cost-effective automation that will support in improving conversion rates and sales performance of the e-commerce websites resulting in increased profitability.

Keywords:
data science, digital payments, machine learning, sales automation, web science.

Acronyms Used:

AoE	Anywhere-on-Earth
B&M	Bricks & Mortar
B2B	Business to Business
B2C	Business to Consumer
CLV	Customer Lifetime Value
CRO	Conversion Rate Optimization
CTA	Call to Action
DS	Data Science
E-Commerce	Electronic Commerce
IoE	Internet of Everything
IoT	Internet of Things
IP	Internet Protocol
IT	Information Technology
KPIs	Key Performance Indicators
ML	Machine Learning
MobileApps	Mobile Application Software(s)
PCI	Payment Card Industry
R&D	Research & Development
ROI	Return on Investment
SSL	Secure Sockets Layer
TLS	Transport Layer Security
USD	United States Dollars
WebApps	Web Application Software(s)
WS	Web Science
WWW / www	World Wide Web

1. Introduction

The rapid development and improvements in web and computing technology have empowered people and enterprises worldly to connect socially to access the world through internet and world-wide-web (www) also commonly known as social-web [1] [2] [3] [4]. The advent of smartphones, supercomputers, and smart digital devices have further enhanced the effectiveness of this medium. The people of all walk of life e.g. engineers, doctors, lawyers, teachers, businessman, designers, manufacturers etc. with their distinct various age-slabs very frequently access the www through their smart digital gadgets in order to invoke their desired web application (WebApp or MobileApp) resulting in the millions and trillions of macro-effects that are generated and observable over the web in the form of events, blogs, websites etc. [5]. These artefacts i.e. small pieces of information are then collected as data from the web and analysed for business value under the scientific and intelligent approaches of data science (DS), machine learning (ML), and web science (WS) [6] to draw technical and enhanced solution.

The data scientists observe user or system triggered data impact as macro-effect and micro-effects, usually generated due to human interactions with www resulting from information transitions. Such macro-effects are due to change or update or access of the data/information, protocols, application medium, or for any governance to produce or consume the contents [7] [8]. The social web of people and users generate billions or trillions of observable micro-effects as well by sharing their behaviour, feeling, cognition, reaction etc. while surfing www; dropping contents of data or knowledge; hence providing a medium for socialization and mobilization in the society. One of the frequent access to www is "Online Shopping" which directly result in generating huge data and processing the transactions. Online shopping is increasingly becoming a routine part of our daily lives. It is also pushing businesses to collect more useful data to understand their customers in order to come up with products that meet their requirements and true expectations [9]. Usually, third-party analytics applications are available as an immediate tool to collect such user-related data in real-time.
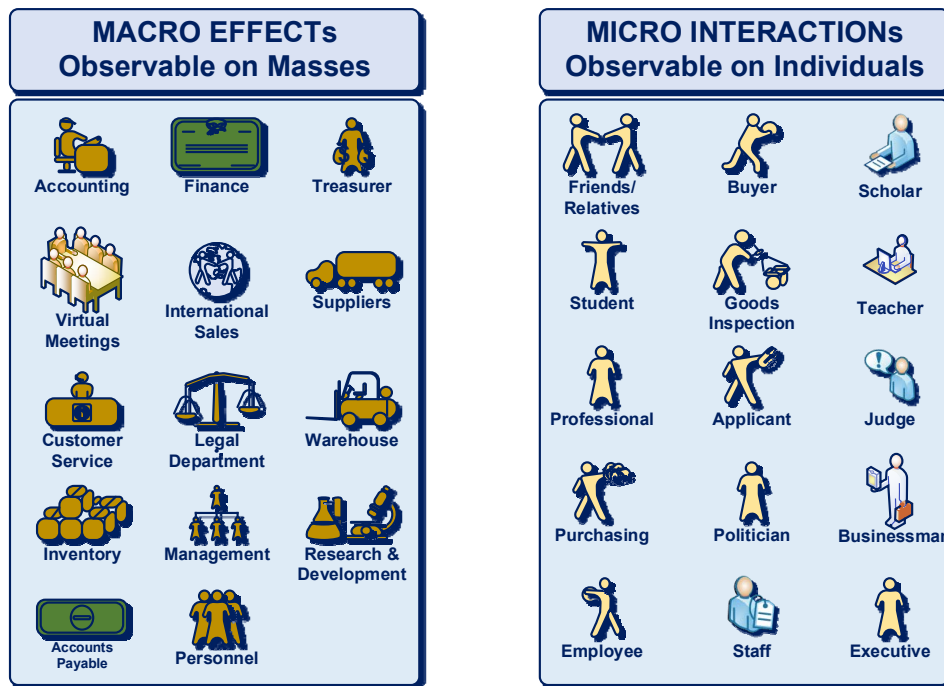
Fig. 1. The Social Web with (a) Macro-effects on business and (b) Micro-interactions of individuals.

The data storage and access mechanism is one of the challenge since past two decades. Data is collected as heterogeneous storage where different databases for different strokes are challenging to handle. According to [N1][N2], the relational database i.e. RDB and compatible database management system i.e. DBMS are de facto choice of developers and data scientists, but with the emergent variety of other alternatives for example NoSQL became best choice of selection to handle use-cases with object-oriented databases (OODBs) usually maintained with Yahoo, Google, and Facebook gurus to handle data generated through social-web, mobile computing, and "Internet of Things" i.e. IoT [N1][N2].

The user's and sales related meta data i.e. information such as web traffic sources, visitor country, and average time spent on shopping website etc. can be further used to understand audience to model visitor's behaviour and buying patterns. Few key measurement parameters e.g. metrics such as the real-time user activity, abandoned cart rates, and the sequence of the actions performed by these website visitors is usually not considered [R17]. Therefore, implementing advanced tools such as heat maps, pixel tracking, and a view of the real-time user session are of great interest to understand more complex buying patterns [R17].

Fig.1 illustrates the concept of social web with macro-effects on business and micro-interactions of individual users. The web science and social web allows people and industries to get connected via digital devices for interactions to access the data on globe via web, generating huge data bank for later analytics carried out by web and data scientists using various artificial intelligent (AI) and machine learning approaches.

This paper describes ways to improve conversion rates and sales performance of e-commerce websites using strategic data driven approach.

With the introduction in Section-I, the Social Web, Section-II describes Section-III elaborated briefly the concept frame of SCM practice, its activities, focal and functional areas, along with generic change control process.

The notion of traceability is discussed in Section-IV with the need and benefit of traceability in Section-V. The paper is concluded in Section-VI. The list of acronyms and abbreviations used in text is also presented at the beginning.

2. Discussion

One of the popular e-commerce giants and China's largest multinational e-commerce group company, Alibaba Group Inc., specializing in e-commerce, retail, Internet and technology, is consistently developing and implementing sophisticated data mining and machine learning algorithms along with retail automation processes that not only help them in analysing bulks of data sets collected from various web portals including pages of their websites, but it also help them to smartly and swiftly grow their business [10] [11][R17].

Another e-commerce giant, Amazon Inc. a Washington-based multinational company known for utilization of internet technology especially in e-commerce, cloud computing, artificial intelligence and data science; reputed as the largest e-commerce marketplace and cloud computing platform on the globe measured by revenue and market capitalization [12], has estimated that 90% of all the data generated by mobile devices such as tablets and smartphones etc. are never analysed. In fact, Amazon Inc. also states that around 60% of this mobile data starts losing its value within milliseconds of being generated [13] [14][S5/R34][S6/R5].

3. E-Commerce Web Structure

The E-Commerce web structure is dependent upon network structure. The smart components of E-Commerce today are the set-up i.e. IT Infrastructure and configuration of social-web, Internet of Things (IoT), Internet of Everything (IoE), the concrete concept of Anywhere-on-Earth (AoE), and different Databases for different strokes such as ETL (Extract, Transform, and Load), HDFS (Hadoop Distributed File System), and RDBMS (Relational Data Base Management System). The smart machine learning and data mining tools are widely used to access and retrieve the data. Some of the key discussion on these components is given below. Fig.2 illustrates the concept of IoT, IoE, AoE, and Social Web.

3.1 The Social Web

"Social-Web", where the people are mostly linked with www, which provides a set of social relations among such virtually generated links and connections [15]. The social-web encompassing the design of websites and software applications to support and foster the social virtual interactions [16]. The online social mediums provide vast online activities of business, commerce, education, and learning including online shopping, learning via course-web, distance education, playing games, and communication websites etc. [9]. The Web 2.0 communication standard has facilitated the people having similar interests to do social interaction out of bound and obtain facility to access the relevant contents through the web from Anywhere-on-Earth (AoE) [17] [18].

Fig. 2. Web Science and Social interactions of Human-Computers and WWW Globe.

3.2 The Internet of Things (IoT), Internet of Everything (IoE), and Anywhere-on-Earth (AoE)

The concepts of the Internet of Things (IoT), Internet of Everything (IoE), and Anywhere-on-Earth (AoE) are related to Web Science. All physical objects or material things e.g. appliances, devices, vehicles, books etc. could be connected via a communication network to exchange data, can be operated remotely from AoE – Anywhere-on-Earth, using an assigned IP Address or RFID mechanism [19]. These things could be systems embedded with electronics, sensors, software, actuators, etc. which could be connected via wireless network to enable interaction over the social web from anywhere on earth around the globe or in space or sky reach. Each object possesses uniquely identifiable IP Address and has embedded computing system to inter-operate within existing internet technology infrastructure [20] [21] [22].

3.3 System and User Triggered Macro-Effects and Micro-Interactions

The business and commerce functions of any industry such as accounting, finance, cash-flows, virtual meetings, international sales, supply chain, customer service, legal affairs, warehouse, inventory, personnel management, banking, and research & development (R&D) etc. raise macro effects that are observable on masses [23]. The millions and trillions of macro-effects are generated at every nano seconds over the web in the form of events, blogs, websites etc. which are then collected as data from web, and analysed for business value under the scientific and intelligent approaches of machine learning, web science, and data science.

The data scientists observe the macro-effect and micro-effects due to human interactions with www resulting in information transitions. Further, macro-effects are reflected due to change, update, or access of the data/information, protocols, application medium, or for any governance to produce or consume the contents. The social web of people and users generate billions or trillions of observable micro-effects sometimes called interactions by sharing their behaviour, feeling, cognition, reaction etc. after surfing www; dropping contents of data or knowledge; hence providing a medium for socialization and mobilization in society at a fast pace that comprises of individual such as buyer, scholar, student, teacher, professional, applicant, judge, politician, businessman, staff, and executive [7] [8].

Fig.1 and Fig.2 describe the concept of social web where people are connected via digital devices, with macro-effects on population masses like the spread of news impacting population; and micro-interactions of individuals, for example, feeling them happy, sad, or stressed. These interactions are established to access the globe via web, generating huge data for later analytics carried out by web and data scientists.

4. Data Science, Machine Learning and Web Science Approach

The Data Science (DS), Machine Learning (ML) and Web Science (WS), approaches are indeed required to scientifically develop methods, processes, algorithms with software applications to extract purposeful and timely information from user provided structured and unstructured data collected from e-commerce websites. The expertise of data mining and big data is also used to analyse business and market trends on temporal scale. It also unifies data engineering, statistical methods, machine learning algorithms and programming procedures, to recognize fuzzy temporal phenomena [24]. The strong knowledge and expertise of mathematics, statistics, information sciences, and computer science with artificial intelligence is required and much useful [25] [26] [27] [28].

Machine learning is the sub-field of Computer Science i.e. it comes under "Artificial Intelligence", which is the scientific study of algorithms developed under stochastic theory which is effective to perform tasks without having explicit program instructions, based on inference and relying on patterns. The mathematical model of sample data i.e. "training data" is built via machine learning methods to make decisions on data and predictions are drawn [29]. To maintain homogeneity in results, three (03) methods of machine learning i.e. (1) Supervised Learning, (2) Un-Supervised Learning, and (3) Semi-Supervised Learning, are broadly used. The mostly used methods of "Supervised Learning" are distributed into two categories "Classification method" and "Regression method"; where "Classification method" covers techniques of Support Vector Machines, Discriminant Analysis, Naïve Bayes, Nearest Neighbour, and Neural Networks; however "Regression method" covers techniques of Linear Regression, Ensemble methods, Decision Trees, and Neural Networks. On the other hand, "Un-Supervised Learning" follows "Clustering" which covers K-Means, K-Medoids, Fuzzy C-Means, Hierarchical, Gaussian Mixture, Hidden Markov Model, and Neural Networks.

4.1 Supervised Learning

The data from the web usually develop patterns, which provide learning for a smart computer system. An association is built with meta-data, which represents some "Past Experiences" of buy sell or any transaction or information transition made at internet over specific instances of time. The focus of program is set to "learn" a target function e.g. market trend etc. to predict discrete classes or categorical set business parameters. Such learning method is called "Supervised Learning" or "Inductive Learning" for "Classification" [30]. In other words – Supervised learning is the machine learning task of inferring a function e.g. sale or purchase or customer visit to stores etc. from labelled training data [31]. Supervised learning also discovers data patterns that relate data attributes with a class

i.e. target attribute. These patterns are then become handy in use to predict the key values of the target attribute in future datasets [32] which provide critical success indicators. A two-step "Supervised Learning Model" could be used for prediction and accuracy as depicted in Fig.3. While Equation.1 is used to calculate the "Accuracy" of outcome. Step-1 is referred as "Training" i.e. learn through patterns, and Step-2 is an action to "Testing" of the model for data accuracy, to achieve quality results.

Step-1 (Training):　　Learn and model the training dataset

Step-2 (Testing):　　Test the Model for Data Accuracy

$$Accuracy = \frac{Number\ of\ Classifications}{Total\ Number\ of\ Test\ Cases} \quad \cdots (1)$$

4.2 Un-Supervised Learning

Sometimes, un-supervised learning method is useful. In unsupervised learning, the machine simply receives inputs but obtains neither supervised target outputs nor rewards from its environment. Since the data has no target attribute, some intrinsic structures called "Clusters" are taken. Clustering is often called an unsupervised learning method as no class values are given which denote any priori group of the data instances. It may seem somewhat mysterious to imagine what the machine could possibly learn given that it doesn't get any feedback from its environment. The quality of a clustering result depends on the algorithm, the distance function, and the application. K-means is the most popular clustering algorithm due to its simplicity, efficiency and accuracy. Clustering is highly application specific and to some extent subjective [32]. This provide the creation of big-data on servers.

4.3 Semi-Supervised Learning

It is also called "Partially Supervised Learning". This learning method deals with a small dataset of labelled examples and a large dataset of unlabelled examples. Using unlabelled data can improve the accuracy of classifier when the data fit the generative model [33]. For example, if we want to train an email classifier to separate spam from important messages, then sample 'S' of data is taken and labelled according to category i.e. whether data is or is not a spam. Then the classifier is trained on 'S' keeping in view that it is not over-fitting. This method is vastly used to classify new ever incoming emails [33].

5.　The Business & E-Commerce Model

The e-commerce business model is simply an online retail shop unlike the traditional Bricks & Mortar (B&M) retail stores, where the customer submit order for a product from merchandizing website. This merchandizing website is known as e-commerce website or simply an online store

built on E-Commerce Business Model. This model is an integrated e-commerce web portal having linked modules for payment processing service as well as inventory or warehousing medium. Such services allow customer to seamlessly purchase or sell and pay online through credit card or an internet wallet service. Beside this the product as per need of the customer could be virtually and remotely visible and available for delivery.

On the basis of the above model-ship, the e-commerce model could be classified into numerous categories but the two most popular ones are (1) B2C – Business to Consumer, and (2) B2B – Business to Business [34].

5.1 Business-to-Consumer (B2C)

Business-to-Consumer e-commerce model can be a retail store selling groceries online to its consumers and it can also be an independent fashion brand selling merchandise to its consumers directly via their e-commerce website. Irrespective of the product been sold, the B2C e-commerce model revolves around the idea of selling product directly to the end consumers without any interference of any intermediate salesman. For example, Amazon Inc. is known for its oldest and the most popular B2C e-commerce marketplaces in the world. The similar business venture, "Daraz" established in 2012 is the South Asia's one of the biggest e-commerce webstore currently operating in Pakistan, Bangladesh, Sri Lanka, Myanmar and Nepal had been recently acquired by the Chinese giant Alibaba Group Inc. in May 2018 [34] [35].

5.2 Business-to-Business (B2B)

The B2B model is quite different from the popular B2C model as the name itself clearly tells. The whole idea of a business-to-business model is to make a buying relationship between two business entities no matter if either of the two is an independent or a large enterprise. The B2B buyers do not involve for having face to face interaction, but wanted to deal everything digitally. In fact, the sale completion and the transaction could be done successfully without any condition for the two parties to meet in person or having session on physical space on earth.

According to the summary presented by Kenneth Wagner, for "Inside Sales Virtual Summit 2013", the buying pattern has been transformed into opportunity by having abundance of instant knowledge of current sale in B2B market. The Giles House, Chief Merchandizing Officer at CallidusCloud Inc. presented the quick numerical facts that 70% of the sale is made in advance, 24% of the buyers' time is killed for searching of product information, and 21% buyers are subscribed with social media advertisers. Jill Rowley, a social selling evangelist at Oracle Inc. says that 57% of the business is furnished prior to opening with sales, 92% of buyers first search product insights on internet before purchase, and 37% of customers post comment and questions about the product for prior feedback and

references. According to the views of Brian Frank from Sales Effectiveness Inc. at LinkedIn, 75% of B2B deals are made at social media, 57% of the purchases are made before getting in-touch with salesman, and 97% of the time, cold calls failed to work, incentive-based warm calls become more effective [36] [34].

The web portal of Alibaba Group Inc., a Chinese e-commerce giant, and the largest B2B marketplace provider in the world, is one among such examples. Independent retailers, distributers, wholesalers, and even large enterprises can find suppliers and source products in bulk to sell them.

5.3 Challenges in the E-Commerce Space

As a matter of day to day business, the old business mind-set and an obsolete operational infrastructure of shopping still exist in same traditional way. The retail market is therefore operating online in same conventional and classical way for past two decades. This resulted in very meagre innovation where very few significant improvements are observed limited to specific areas. Such as the old and costly internet payment gateways are replaced by faster and affordable alternatives like PayPal and Stripe payment services. The retail software is upgraded to a new way of cloud applications operated as WebApp or MobileApp. However, the original infrastructure of both the retail and the e-commerce industry has not been evolved, which could be considered as challenge to revolutionary business and marketing change. Some apparent challenges that e-commerce space is facing are (1) Handling logistics and distributions, (2) Payment security issues in e-commerce, (3) Warehouse management, and (4) Lower sales conversions on-site [34].

5.3.1 Handling Logistics and Distributions

One of the biggest problems that e-commerce businesses are facing is the efficient handling of logistics and the distributions network. Most logistics companies are not furnished to provide services to the modern e-commerce businesses. Therefore, many new e-commerce stores fails to meet the requirements of high efficiency resulting in a poor on-time delivery.

5.3.2 Payment Security Issues in E-Commerce

Payment security in e-commerce has always been under the spotlight. Although the payment gateways and processors have outgrown in terms of their subscriber base and average transaction volume, there is still deficiency of secure and stable security systems especially in developing markets.

5.3.3 Warehouse Management

Usually warehouse management staff do not possess $360°$ visibility to their inventory stock. They usually face difficulties such as running out of the required stock at the very last minute at the time of an immediate demand from customers. This fallacy directly impact in letting the company's cash flow to fall.

5.3.4 Lower Sales Conversions On-Site

According to [37]: "The conversion rate is metric which is calculated as the percentage of the number of users who process the complete purchase on e-commerce website among total number of visitors of that site." For example, www.daraz.pk, a popular e-commerce website visited by 1000 customers during a particular month i.e. March to buy a perfume, but only 60 people actually processed the complete purchase, hence the site conversion rate became 60/1000 equal to 6%.

Another view of a successful "sales conversion" is one in which the user follows the "Call-to-Action" (CTA) and completes the steps that were required to be performed. For example, in order to get more email newsletter subscribers for a brand, a visitor on a website must have to enter his email address and name. Each successful subscription would be counted as a "conversion" in this case.

In reality, this is one of the most challenging areas for every e-commerce website, especially the new ones in the market, that although receive a decent traffic, some thousands of monthly visitors to the website, but still only a minority of those actually complete the purchase and show a conversion.

Down the road, when it comes to online advertising such as Facebook Ads or Google Advertising, specifically for the e-commerce businesses, sales conversion is one of the most important metric i.e. "Key Performance Indicator" (KPI) to analyse the user behaviour, engagements and purchases. All of these metrics assist in determining the final return on investment (ROI) from online advertising for the company. In fact, one simply cannot ignore the ROI factor as it is the judging criteria to decide whether a marketing channel should continue to be used for brand awareness or not. Let's say a small amount of $80 for a day was spent on ads that resulted in total 16 sales on the e-commerce website with an average cart size of $150. This could be considered as a profitable merchandizing or advertising campaign that gives the return on investment and the company would continue to leverage this marketing channel with higher ads spent. Alternatively however the same e-commerce company would take if they spend $1000 for seven days on the same ad campaign but fail to get their return on investment. This is where the concept of improving conversions rise [34].

6.   Methods to Improve Conversions & Sales

Improving conversion rate a metric generally called "Conversion Rate Optimization (CRO)". These are data-driven approaches along with a series of procedures through which any web portal, WebApp or an Advert could be improved and optimized in order to achieve increased sales and maximum revenue with better usability and high on-site

user engagement. "Sales" metric is one of the most important metric highly needed to be improved to achieve higher conversions. Numerous data science and analytical techniques are implemented on e-commerce websites which are producing data, that later produce considerable results with optimized metrics for decision making. Some of the techniques are still under experiments.

6.1 Performing A/B Testing

According to [38]: "A/B testing is an eccentric way for framing the best online promotional and marketing strategies for any business." It is a method to select design, content, and functionality of webpage that seems more successful for conversion factor by website visitors. This test is also used to test website copy, sales emails, search Ads, and so on etc. The variation in components or elements of a page that may affect the actions or behaviour of site visitor could be tested easily. The iterative A/B testing is more effective to find improved version. There are two types of A/B testing: (1) Client-side and (2) Server-side, with client-side being the more common. Client-side testing involves showing the exact same version of a page to every website visitor and then using JavaScript to make changes within the visitor's browser before the visitor looks to the resulting page. On the other hand, Server-side testing is applied when the web server shows visitors with different page variations, altering them on the server before they are sent to the visitor's browser. No modifications to the page are permissible at the browser. A/B testing can be applied in the cases where an e-commerce owner wants to compare: (1) Various page-layouts, (2) Navigation organization, (3) Headline effectiveness and content, (4) Website photography and product images, (5) New visual styling for a page, and (6) New pricing strategy or different promotions and offers [38].

Some of the research tools used are included as: (1) Analytics, (2) Heatmaps, (3) User Tests, and (4) Surveys. The detail description of research tools is elaborated in Table-1. After doing a thorough analysis of the customer's behaviour, an e-commerce business can begin to develop hypotheses about their current website and how they might improve the overall customer experience. These hypotheses then form the basis of the A/B testing roadmap.

6.2 Retaining Buyers using Email Marketing

According to the study on returning customer after successful sale [39], a customer has a 27% chance of buying from the same e-commerce website again. If they make a second and third purchase, they have a 54% chance of making another i.e. fourth purchase [40], hence adding value to business. Today, in order to get the most out of "customer lifetime value (CLV)", an e-commerce website need to retain, upsell, and cross-sell their customers. In order to do that in a world of increasing population and market competition, they have to stay top-of-mind. An email marketing is still the top way in which most people are easily reachable. The significance to retain customers in a way that

encourage them to return and refer the product or shopping web again, is to make them feel like they are part of a brand's family, where customarily and socially, the families should always stay in touch. The timely emailing to the customer with the release of a brand or any promotional sale with relevant content on regular basis builds trust and importance of that demand in their running life. Customer will surely recommend that product or brand to other members of family or friend first psychologically if he get himself satisfied with such dealing of care. It costs 5 to 10 times more to acquire a new customer, than efforts required to retain an existing customer as a returning customer [41]. Every time a customer returns, it is more likely for him to return and buy again since returning customer build businesses [39]. The retention rate could be maintained and increased by email campaigns, push-sales etc. that definitely increase the ROI.

6.3 Optimizing Checkout Process

Optimizing the entire checkout process is a core technical work that requires lot of testing at the developer's end. For example, an e-commerce website having a separate payment page where 84.71% of the visitors' traffic land to buy a product. If we increase this percentage to 90%, that would result in generating 461 more orders and an additional USD $87,175 per month. If we take a close look, that's a surprizing rise in revenue of 23.94%. Although it seem little count, but considered a gain in revenue [34]. Similarly, another good technique to apply is to make the shopping cart and products added to it along with the "Checkout" or "Order Now" button to remain visible at all the time until the user clicks somewhere else. Also, changing the "Checkout" button colour to something that stands out – mostly yellow or green – is also known to work and could be another advantage [34].

Implementing the concept of up-selling and cross-selling has also proved to work. When customers on popular e-commerce websites such as "AliExpress.com" and "Daraz Online" adds a product to their shopping cart and proceeds to the checkout page, the website automatically shows them the upsells or in short – targeted products that are highly relevant to what they are buying. For example, if a customer has added a denim jean to his cart, the website might display t-shirts that would look good with that specific jeans. Interestingly, these sites are programmed to dynamically shrink cart contents, so that the upsells stand out from all the other products that are displayed [34]. There are some fundamental and generally accepted rules for displaying cart contents. These rules are:

6.3.1   Visibility

Throughout the buyer's journey, the shopping cart feature should clearly display all the products that are added to the cart and also show the total cost of the basket. The reason behind this is to avoid card abandonments on the checkout page.

6.3.2   Control

The customer must have the control to easily make any changes to the product quantity or even remove them.

Another amazingly profitable strategy that many e-commerce business owners today still don't know about is the Cart Abandonment. It is very common to see that most visitors on a website who click on a product to add it to the shopping cart, usually don't complete the checkout process and leave the website without making any purchase. This heavily results in a great loss of sales and revenue.

As a solution, if we do not let the cart contents expire and leverage the technology of cart abandonment email reminders and retargeting ads to bring those potential customers back to the same checkout page can dramatically increase conversions and recover lost sales.

The last phase of the checkout optimization is tweaking the payment fields. If the customer has entered the shipping information first, only then they must be able to get into the billing part. This multi-step form process is used to push the customer towards commitment and consistency. The logic behind this is very simple – when a human brain starts doing something, it focuses the person to eventually finish it. This little psychological hack could significantly add up sales.

6.4 Increasing User Trust

Security and online privacy is one of the most important concern for many of us who are doing business activities or even buying activities online. Customers, especially in countries like Pakistan, still are afraid to use credit or debit cards online to avoid any mishaps or potential theft. Therefore, it is essential for an e-commerce website of any kind to ensure the use of end-to-end encryption from origin server to the client side via SSL and TLS certificate.

If an e-commerce website is already using all the required security protocols, it is still important to tell visitors about it by displaying site security seals and PCI compliant labels prominently on the payment or checkout page. Moreover, a few proven techniques to let customers know that their details are secure are:

1. Using different background colour for payment form – preferably light green colour.

2. Displaying SSL certificate logo or a green padlock icon.

3. An additional written statement with the SSL logo such as: "Payment secured by 256-bit SSL Encryption"

In general, most users are not very technically aware and therefore they probably are not aware of terms like SSL or https secured, so telling them about their data security in plain terms is also a good idea.

7. Conclusion

Looking good and making a positive first impression takes time and effort. Just like a person's favourite dressing and accessories in a brick and mortar retail shop likely required many hours to shop around for the right pieces to find the ideal colours and sizes, and update or throw out items as new styles became popular. Likewise, as new e-commerce technologies emerge, and user behaviour and preferences evolve in the future, so too must an e-commerce website.

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