E-COMMERCE FRAMEWORK

The term **e-commerce framework** is related to software frameworks for e-commerce applications. They offer an environment for building e-commerce applications quickly.

E-Commerce frameworks are flexible enough to adapt them to your specific requirements. As result, they are suitable for building virtually all kinds of online shops and e-commerce related (web) applications.

- allow replacing all parts of the framework code
- forbid changes in the framework code itself
- contain bootstrap code to start the application
- be extensible by user-written code

E-Commerce frameworks should

- define the general program flow
- consist of reusable components
- be organized in functional domains

Examples of e-commerce frameworks are

- Aimeos (Laravel, Symfony, TYPO3, SlimPHP, Flow)
- Spryker (Symfony only)
- Sylius (Symfony only)

They provide an overall structure for e-commerce related applications. Furthermore, they implement the general program flow e.g. how the checkout process works. Contrary to monolithic shop systems, existing program flow can not only be extended but completely changed according to your needs.

E-Commerce framework architecture

E-commerce frameworks must be based on a strong architectural model. Usually, they make heavy use of interfaces and design patterns like

- Dependency Injection (make components independent of used object implementation)
- Factories (create objects at a central place that instantiates the actual implementation)
- Decorators (dynamically add functionality to existing objects)
- Publish/Subscribe model (notify listening objects about changes instead of polling for updates)

A "design pattern" is re-usable solution that solves similar software design problems in an elegant way. They require programming language templates which enforce public class methods and their signatures called "interfaces".

Successful implementation of any ecommerce business is dependent on implementing or adopting these seven key steps:

- Planning for eCommerce Business
- Technology Selection/Website Audit & Analysis
- Customer Acquisition
- Customer Engagement
- Customer Retention
- Optimizing Key Metrics, and
- Business Analysis & Customer Insights

Each of these steps has a positive and cascading effect on the other steps and hence implementing each of them in the right priority and in a phased manner is of utmost importance.

For an e-commerce business to get the maximum ROI on their investment, it is the execution of these 7 steps around the 4 core pillars that will be your mantra for success!

1. Strategic business planning and roadmaps – Strategy is about making the right choices that will help reach the stated business objectives.

There should to be a *clear cut vision, mission and objective about what will be achieved, in how much time, within what budget, identification of the right resources* for and constraints in the face of execution of the strategy mentioned in the business plan, and what elements will be considered for roadmap. Knowledge and deep understanding of the digital marketing tools and techniques that will help in reaching and acquiring customers is required

2. Technology selection/ website audit and analysis – In order to provide the maximum benefit to the end customer, your chosen ecommerce technology should be fully capable of being customizable, and be able to complement the business model, and adhere to the existing best practices in offline retail.

If you're a retailer taking the first-time plunge into ecommerce, various functionalities on the e-commerce website should be carefully thought over based on the industry, audience being targeted, various customer segments who may be buying the offered products and services.

3. Customer acquisition – Online or popular digital marketing encompasses multiple tools for reaching out to the new generation of customers, who are actively engaged in using multiple devices, through search engine optimization, search

engine marketing (paid advertisement that includes both cost per click and cost per thousand impressions), social media marketing (that includes both cost per click and cost per thousand impressions), email campaigns, display advertisements using various ad networks, referral programs and re-targeting campaigns.

4. Customer engagement – Customers these days are actively seeking to engage with brands to understand the core benefits and unique value proposition that the brand offers, discount and offers during special seasons, a robust support mechanism for queries/clarifications regarding the products displayed and interaction with customer support executives to know more about policies on returns and exchange, etc.

Engaging customers through various social media channels also instils superior trust in the minds of customers.

5. Customer retention –With the advent of sophisticated e-commerce technologies, new age retailers will be able to leverage an almost one-to-one customer experience and that's the best a customer can really expect.

6. Optimization based on key metrics – Some of the key metrics to measure the health of an ecommerce venture are the total revenue generated, cost of customer acquisition, % of customers converted, and % of customers entering the website through various channels.

- **a. Technology** – This generally includes optimizing the page load speed, shopping cart, check-out and other web pages, a/b and multivariate testing, etc.
- **b. Business** – Optimization here includes analysis of the total revenues generated, total spends for running the e-commerce operations, optimizing the gross net margins, conversion rates from each of the various channels, customer loyalty and retention rates, rate of repeat purchase, frequency of repeat customers (across multiple dimensions), % of carts abandoned, etc.

7. Business analysis and customer insights – The final step in the entire process is about fine-tuning and understanding the product categories that have performed well compared to other products displayed in the web store. Assessing this is crucial since each of these categories and products within those categories occupy the prime real estate in the online world – the web store.

- It also should consist of understanding the customer segments, demographics, profitable customers, source of channels through which the profitable customers came

to the web store, % of revenue each profitable customer contributes to and the marketing spends that has gone into acquiring these customers.

- These metrics are only a small representation of a larger list that can be optimized further. These metrics vary based on the business needs and require a customized approach for defining, monitoring and optimization.

E-commerce Industry Framework and associated technology:

Introduction

The basic framework of e-commerce enables doing business online. The framework consists of a comprehensive structure beginning with the based technology layer to the general service layer. E-commerce has, to a certain extent, changed markets structure. Traditionally, market ties were created through the exchange of goods, services, and money. E-commerce has brought in an essential element: information. Market ties are now based on information services, information goods and electronic money. Although the nature of exchanging products remains unchanged, the channel and the format of doing business have changed. To better understand the basic framework of e-commerce, the following paragraphs explain the features of the major layers in the environment of e-commerce.

Basic Framework

1. The First layer: Network Infrastructure

Also known as the "Information Superhighway", network infrastructure is the foundation layer of hardware infrastructure. It is a mixture of many forms of information transport systems, which include telecom, cable TV, wireless and the Internet. These systems, in particular the Internet, provide various types of telecommunication channels for transmission of contents used in e-commerce.

2. The Second Layer: Multimedia Content and Network Publishing

While the Information Superhighway is the transportation basis that allows content such as text, sounds and images to be transmitted, the second layer provides an architecture that enables the content to be developed in a programming language know as Hyper Text Markup Language (HTML) for publishing on the World Wide Web (WWW). Another programming language in use is Java, which enables multimedia content to be transmitted to end users' personal computers via various networks such as cable, wireless, fiber optics and satellites.

3. *The Third layer: Messaging and Information Dissemination*

Messaging transmission is usually done by the following technologies:

(a)   Communicating non-formatted data: by using facsimile, electronic mail, which mainly directs to individuals.

(b)   Communicating formatted data: by using Electronic Data Interchange (EDI) without human intervention. It is mainly used for business documents such as purchase orders, invoices and packing lists. Messaging transmission technology has encouraged business process automation.

(c)   Hyper Text Transfer Protocol (HTTP): HTTP is an information dissemination tool generally used on the Internet. It uses a common display format to publish non-formatted multimedia messages in various environments.

(d)   Uniform Resource Locator (URL): URL is at present used by many web surfers to search for information.

4. *The Fourth layer: Security Protection in Business Services*

This layer is regarded as the essential facilities for doing business because it is required by both business corporations and individuals in business transactions. The facilities include standardized product catalogues, price lists, electronic payment methods, secured transmission of business information, and the authentication of identity of both trading parties. The ultimate goal of e-commerce is that the seller gets the payment and the buyer obtains the product. To ensure transaction security, e-commerce needs to ensure content reliability, integrity, non-repudiation, and to provide the relevant evidence in case of disputes. Therefore, payment security on the web is crucial to ensure smooth completion of a transaction. The prevailing method of security measure is by electronic certification which provides 'end-to-end' security protection.

5. **The Fifth layer: Practical Application of E-commerce**

E-commerce is widely employed in supply chain management, electronic marketing, electronic advertising, online shopping, online entertainment, pay-information service and network banking.

Benefits, Limitations and Barriers of e-commerce

BENEFITS OF E-COMMERCE:

Today, e-Commerce has revolutionized the way companies are doing business. Now, consumers can purchase almost anything online 24*7 a day and get an ultimate shopping experience.

Before you opt for an e-Commerce business, have a look on its comprehensive benefits that you can enjoy:

Convenience & Easiness:

For many people in the world, e-Commerce becomes one of the preferred ways of shopping as they enjoy their online because of its easiness and convenience. They are allowed to buy products or services from their home at any time of day or night.

The best thing about it is buying options that are quick, convenient and user-friendly with the ability to transfer funds online. Because of its convenience, consumers can save their lots of time as well as money by searching their products easily and making purchasing online.

Offer Product Datasheets:

Consumers can also get description and details from an online product catalog. For your customers, it is very much important to get information about the product no matter whether the time of day and day of the week. Through information, your customers and prospects are making decision to purchase your products or not.

Attract New Customers with Search Engine Visibility:

As we all know that physical retail is run by branding and relationships. But, online retail is also driving by traffic that comes from search engines. For customers, it is not very so common to follow a link in the search engine results and land up on an ecommerce website that they never heard of.

Comprise Warranty Information:

No matter whether you are looking to choose including warranty information with product descriptions and datasheets or providing it from within an ecommerce shopping cart, you need to make sure that customers must be aware of important terms and conditions that are associated with their purchase.

Decreasing cost of inventory Management:

With e-commerce business, the suppliers can decrease the cost of managing their inventory of goods that they can automate the inventory management using web-based management system. Indirectly, they can save their operational costs.

Keep Eye on Consumers' Buying Habit:

The best thing is e-commerce retailers can easily keep a constant eye on consumers' buying habits and interests to tailors their offer suit to consumers' requirements. By satisfying their needs constantly, you can improve your ongoing relationship with them and build long-lasting relationships.

Competence:

For effective business transactions, e-commerce is an efficient and competence method. Setting-up cost is extremely low as compare to expanding your business with more brick and mortar locations. Very few licenses and permits are required to start-up an online business than physical store. You can save your lots of money by using fewer employees to perform operations like billing customers, managing inventory and more.

Allow Happy Customers to Sell Your Products:

With lots of customers' reviews and product ratings, you can easily increase your sells as new customers find that your products are good and effective. Make sure that you mention your clients' testimonials, reviews and product ratings as such things can help your new customers to purchase your products.

Selling Products Across the World:

If you are running a physical store, it will be limited by the geographical area that you can service, but with an e-Commerce website, you can sell your products and services across the world. The entire world is your playground, where you can sell your complete range of products without any geographical limits. Moreover, the remaining limitation of geography has dissolved by mcommerce that is also known as mobile commerce.

Stay open 24*7/365:

One of the most important benefits that ecommerce merchants can enjoy is store timings are now 24/7/365 as they can run e-commerce websites all the time. By this way, they can increase their sales by boosting their number of orders. However, it is also beneficial for customers as they can purchase products whenever they want no matter whether it is early morning or mid-night.

Economy:

Now, you don't have to invest your money in the physical store, insurance or infrastructure as all you need is a wonderful idea, unique products and well-designed website to reach your precious customers to sell your products and services. We can say that this makes an e-commerce a lot more economical and reasonable.

Boost Brand Awareness:

As like e-commerce business can help B2B organizations to get new customers, so it will be helpful for e-commerce businesses to boost their brand awareness in the market. Developing

pages that can be indexed by search engines crawlers is one of the best ways to enhance your website' search engine optimization and enhance the target audience on your site.

Decrease Costs:

One of the most positive things about eCommerce is that you can decrease the costs of your business. Below are some of the costs that you can reduce by opting for ecommerce.

Advertising & Marketing Cost:

If you opt for ecommerce, you don't have to spend your money on advertising and marketing. However, organic search engine traffic, social media traffic and pay-per-click are some of the advertising channels that are cost-effective.

Personnel:

A complete automation of check-out, billing, inventory management, payments and other type of operational costs lower the total number of employees that you require to run your ecommerce business.

Eliminate Travel Cost:

Now, customers do not have to travel long distances to reach their desired stores as ecommerce allows them to visit the e-store anytime without traveling. With few mouse clicks, customers can make their purchase and have wonderful shopping experience.

Offer Huge Information:

One of the best benefits of ecommerce for customers is they can get huge information that is not possible in a physical store. We all know that it is quite difficult to equip employees to respond to customers who are looking for information on different product lines.

Analytics:

We can say that business 2 business offers an excellent platform to organizations to launch their complete range of analytics campaign. Through ecommerce, organizations can easily calculate and evaluate sales effectiveness, customer effectiveness, marketing campaigns, product mix, customer engagement and more.

Expand Market for Niche Products:

It is difficult for buyers and sellers to find each other in the physical world, but it becomes very easy for them with the inception of e-store. Customers can search their required products on the web and can purchase it from any corner of the world. No matter what kind of product customers are looking, they can find all types of products without any hassle.

Scalability:

With effective ecommerce solution, you and your organization grow and scale easily to meet market demand as well as customer requirements by introducing different sales channels and reaching market segments.

Ability of Multi-site:

With ecommerce platform, it becomes easy for businesses to launch channel specific and particular brand ecommerce website. This ability enables you to provide co-branded websites for your specific customers and allows for websites catering to specific international spectators.

LIMITATION OF E-COMMERCE:

1. **Security:** the security risk in ecommerce can be

- client / server risk
- data transfer and transaction risk
- virus risk

2. **High start up cost:**

   The various components of cost involved with ecommerce are:-

- **connection:**- connection cost to the internet.
- **hardware / software:-** this includes cost of sophisticated computer, moduer, routers, etc.
- **maintenance:**- this include cost invole in traning of employees and maintenance of web-pages.

3. **Legal issues:-** these issues arises when the customer data is fall in the hands of strangers.
4. **Lack of skilled personnel:-** there is difficulty in finding skilled www developers and knowledgeable professionals to manage and a maintain customer on line.
5. **Loss ofntact with customers**:- Sometimes customers feels that they doesnot have received sufficient personal attention.
6. **Uncertainty and lack of information:** - most of the companies has never used any electronic means of communication with its customers as the internet is an unknown mode for them.
7. **Some business process may never be available to ecommerce**:- Some items such as foods, high cost items such as jwellery may be impossible to be available on the internet.

BARRIERS TO E-COMMERCE:

There are five biggest barriers to e-commerce-

- ✧ **Search Engine Rankings**

    → The difficult to rank high in search engines is the leading barriers facing the majority of e-commerce websites, especially newer ones.

    → Using descriptive and relevant page titles, descriptions and URLs are some of the easiest things you can do to influence your rankings, according to goggle

- ✧ **Web Design**

    → In an e-commerce study conducted by Peer1, more than three-fourth said that website design impacts customers brand perception leading to higher conversation rates.

    → High performance e-commerce websites have a clean and uncluttered appearance, are fast, provide great content and make it easy for visitors to shop.

- ✧ **Mobile browser Compatibility**

    → Whilst sales of desktop PCs are dropping, those of smart phones and tablets are increasing.

    → More consumers are using mobile devices as their preferred web browser.

    → Since more visitors will be shopping online from mobile devices, e-commerce websites need to ensure cross-platform compatibility across all web browsers.

- ✧ **Slower website performance**

    → A website that takes a long time to load its pages can lead to a high bounce rate and lead to lower search engine ranking.

    → There are a variety of factors that can impede website performance including hosting service, database response, coding, images and video, to name a few.

- ✧ **Shopping Cart/Purchasing**

    → How easy or difficult it is for someone to make a purchase and checkout online can affect conversation and shopping cart abandonment rates.

→ E-commerce websites that do well recommended related products, display user rating and enable shoppers to purchase and checkout with the least amount of click.