A Comparative Study of B2C and B2B e-Commerce Development Platforms

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ABSTRACT
Innovation and Technology has changed the perception of entire world. The world of retail market is also influenced by this unprecedented wave of innovation. Businesses are using e-commerce instead of their traditional ways of trading and marketing. The key focuses while accepting e-commerce are on consumer behaviours, consumer expectations, wider retail value chain and coverage of consumers as much as business can. To use e-commerce for business, one should choose the right e-commerce development platform that can fulfil all the business needs as well as fits into budget. This paper has been written to present a comparative study between the widely used e-commerce development platforms and to help business to choose the right e-commerce development platform.

Keywords
E-commerce, B2C, B2B, E-commerce platforms, SAP-Hybris, Magento, ATG,BigCommerce

1. INTRODUCTION
Electronic commerce or e-commerce refers to a wide range of online business activities for products and services [1]. It also pertains to "any form of business transaction in which the parties interact electronically rather than by physical exchanges or direct physical contact" [2]. Electronic commerce is the process by which businesses and consumers buy and sell goods and services through an electronic medium. Any products or services that are sold or bought online (via internet) through electronic medium (mobile, desktop, laptop etc.), come under E-commerce.

E-commerce emerged in early 1990s, and its use has increased at a rapid rate. Taking the example of today's scenario, everything from daily needs to occasionally required things, you can buy/sell online. We have some examples of such online stores that are providing services to its consumers to fulfil their all kinds of needs e.g. Amazon, Flipkart, Paytm, Myntra, Foodpanda, etc. According to an article, Retail e-commerce sales- which include products and services ordered via internet over any device- will reach $1.915 trillion in 2016, accounting for 8.7% of total retail spending worldwide. The expected retail e-commerce sales will be increased to $4.058 trillion in 2020, making up 14.6% of total retail spending this year [3]. E-commerce business models can generally be categorized in following categories [4]:

(i) Business to Business (B2B): websites sell its products to an intermediate buyer who then sells the products to consumer.
(ii) Business to Consumer (B2C): websites directly sell its products to consumer.
(iii) Consumer to Consumer (C2C): websites help consumers to sell their assets to other consumers.
(iv) Consumer to Business (C2B): websites to which consumer approaches for a particular service from multiple business organizations showed by website.
(v) Business to Government (B2G): it's a variant of B2B, websites are used by government to trade and exchange information with various organizations.
(vi) Government to Business (G2B): government uses this model website to approach business organizations.
(vii) Government to Citizen (G2C): government use this model website to approach citizen in general.

With the boom in smart phone and tablet ownership, E-commerce has one device based category known as **M-commerce**. The term 'm-commerce' stands for mobile commerce, and it's the browsing, buying and selling of products and services on mobile devices. In other words, it's a complete online shopping experience, but with all the convenience of being on a cell phone or tablet [5]. So, basically m-commerce helps the organizations to sell their products and services through mobile devices using any of the above said business models.

To run their business on Internet, organizations choose either B2C or B2B e-commerce model. To implement any of the above model, organizations need a platform that can help to run their business online, to manage all the resources like products, customers etc., to grow their business online and to cover as much as target end users. There are lots of platform now-a-days that help an organization to implement their business and run it smoothly. This study presents some models that are most popular now-a-days for B2C and B2B implementations and which model is best suited for B2C business and which model is best suited for B2B business.

2. RELATED WORK
E-commerce emerged in early 1990s, and after that its use has increased at a rapid rate. Bell and Tang [6] presented the website effectiveness from the consumer's perspective, Teo et al. [7] has examined the rapid usage of Internet, Kim et al. [8] has presented on website designs, Gonzalez and Palacios [9] has presented on commercial websites, Sen et al. [10] presented about pricing paid placements on search engine. To grow their business, organizations had started the online advertisements in place of traditional advertisements. This form of online advertising emerged in 1998 [11], rapidly has become the central business model of the major search engines [12], and is one of the most rapidly growing segments of the online marketing area. McConnell [13] considered e-readiness a prerequisite for successful e-business. Poon and Swatman [14] and Turner [15] found that technology adoption helps for industries to grow and it has lots of benefits for the business. Agrawal et al. [16] and Schneider and Perry [17] has marked a change in perception towards e-commerce before the dotcom crashes of 2000. Akkeren and Cavaye [18] stated the well-known fact that e-commerce and Internet technologies can benefit organisations. Thong and Yap [19] state that if an organization has large amount of data and transactions, then it is more likely to adopt IT which can help streamline operations and offer process efficiencies within the organisation. Cloete et

al. [20] found that small businesses among manufacturing sector in Western-Cape province of South Africa accepted and adopted e-commerce and showed potential benefits of e-commerce.

2.1 Different Models

The most used types of e-commerce now-a-days are B2B and B2C. There are different e-commerce frameworks that are helping the organizations to grow their businesses using any of B2B and B2C models. Some of the most used frameworks are:

2.1.1 Magento

Magento is one of the leading platform for open commerce innovation. Magento works hand-in-hand with the world's biggest retailers, brands, and branded manufacturers across B2C and B2B industries. Magento offers merchants complete flexibility and control over the user experience, content, and functionality of their online channel. Its intuitive administration interface features powerful marketing tools, a catalog-management engine and is SEO (Search Engine Optimization) optimized to give merchants the power to create sites that provide an unrivalled and rich online shopping experience for their customers, tailored to their unique business needs.

In addition to its flagship open source commerce platform, Magento boasts a strong portfolio of cloud-based omni-channel solutions including in-store, retail associate, and order management technologies. Magento commerce is now backed by the Permira funds (founded in 1985), the firm advises funds with a total committed capital of approximately 25 billion [21].

Magento is a PHP based e-commerce development framework that comes with most of the functionalities OOTB (Out Of The Box). The architecture of Magento consists of four layers namely, Presentation, Domain, Service, and Persistence, as shown in Fig 1. Presentation Layer is the layer to which all the consumers or target users interact with. The presentation layer contains both view elements (templates, blocks, layouts) and controllers, which process commands to and from the user interface. Presentation layer makes call to the Service layer, which in turn calls to Domain layer. The Service layer provides a bridge between presentation and the model layer of domain logic and resource-specific data. This is implemented using service contracts, which are defined using PHP interfaces. The Domain layer of Magento does not contain resource-specific or database-specific information, instead it holds the business logic layer of Magento module. The business logic defines which operation can be performed on particular types of data such as products, customer etc. The Persistence layer of Magento contains all the model objects; a resource model that maps an object to one or more database rows. The resource model is responsible for executing all CRUD (create, read, update, delete) requests and performing additional business logic such validations of data.

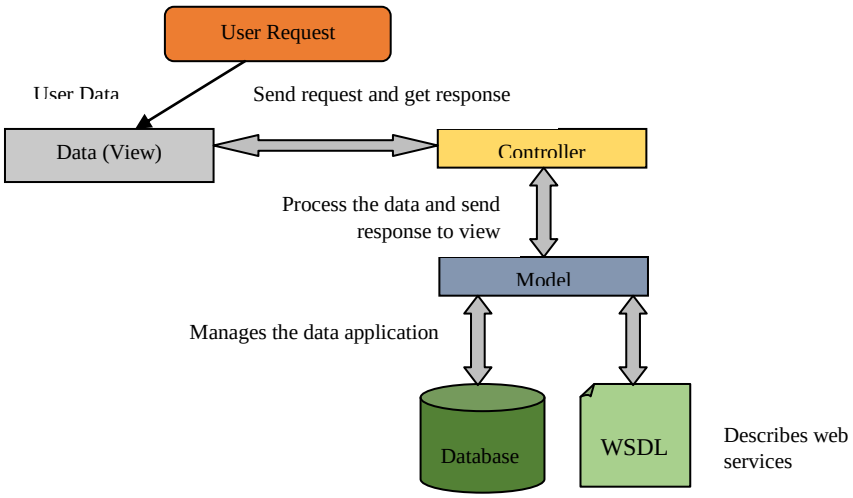

Fig 1: Architecture of Magento

2.1.2 BigCommerce

BigCommerce is one of the leading platform for creating beautiful, intuitive e-commerce websites that enhance your brand and engage shoppers. It offers its customers to build a web site either using OOTB (out-of-the-box) themes or advance customization framework [22].

BigCommerce provides you all the tools to build a modern and high converting e-commerce website. It provides you interactive and beautiful templates, easy setup, reliable hosting and much more. IT includes dozen of features to increase traffic on your website and turn more shoppers into customers.

BigCommerce uses RESTful API (Representational State Transfer) architecture which supports JSON (JavaScript Object Notation) media type and UTF-8 character encoding. This is the underlying architectural principle of the web. The client (browser) and server can interact in complex ways without the client having any knowledge about the server and the resources it hosts. The client sends its request to server in a certain kind of request format (in case of BigCommerce, JSON format) and gets a response from the server in either same or different format. BigCommerce allow the developers to code in the language of their own choice like Java, PHP, C#, Ruby, Python etc. BigCommerce provides its own APIs that can be used to automate various commerce, business and publishing tasks. There are two versions of APIs: v3 Catalog API and v2 Catalog API.

2.1.3 ATG

Oracle ATG (Art Technology Group) web commerce enables user to deliver a personalized online buying experience for each customer by presenting relevant content and merchandising, personalized search, customized marketing programs and tailored websites. ATG Web commerce capabilities allow you to merchandise more quickly, easily, and effectively, rapidly launch commerce sites for new

brands, markets and even single-purpose campaigns, easily create and manage both simple and complex promotions, use mobile devices and social media to drive sales, and quickly expand internationally and target new countries and segments more effectively.

ATG web commerce enables you to deliver an engaging, consistent and coordinated customer experience across all channels, including web, contact centre, mobile device, kiosk, or store. ATG web commerce helps you:

- Personalize the customer journey by creating individualized sites and relevant product content, and personalized search
- Optimize the execution by tailoring recommendations, and providing assistance relevant answers at the point of need.
- Maximize the engagement by increasing agility through merchandising and site administration, delivering a personalized brand experience, and leveraging social data.

Built on a foundation of proven capabilities, including personalization, business user control, cross-channel support, and a flexible platform, ATG web commerce boosts your cross-channel business growth [23].
The diagram below shows the recommended server architecture for a multiple application environment running on Oracle ATG Web commerce.

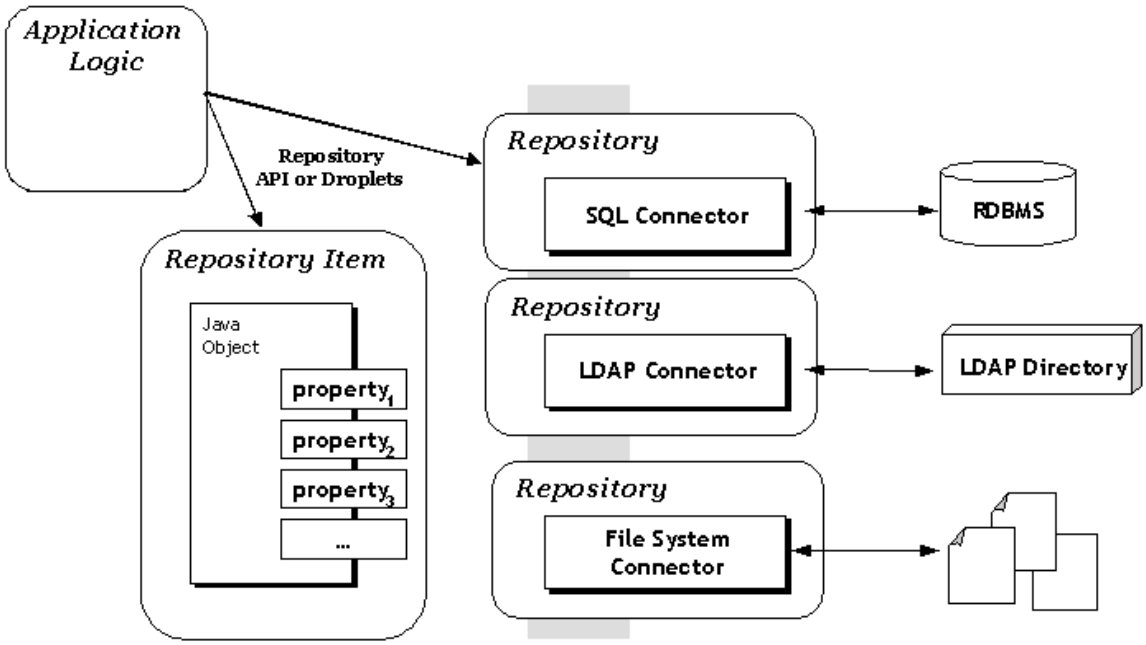

Fig 2: Architecture of ATG web commerce

2.1.4 SAP-Hybris

Five students used their apartments as offices and started to develop software for e-commerce in 1997 named as **hybris** (with a lower-case 'h'). They struggled with their software till 2001, so they decided to go for a new business model. Instead of selling what was essentially a boxed software product to small and midsize enterprises, hybris began to develop and sell web-based product to much larger firms. They changed their technology as per the demands of future and provided a multi-channel commerce by 2010. Early mobile phone platforms hadn't worked but the firm saw the potential. The advance in technology meant hybris had an opportunity to become a true multi-channel software provider. It was a risk but it paid off [24].

In 2013, hybris joined SAP family to become part of the market leader in enterprise application software. On Jan 1, 2016 **hybris** became **SAPHybris**, replacing the lower-case 'h' with and upper-case 'H' to signify the change. SAP Hybris is a software for commerce, marketing, billing, service and sales. It is a powerful stuff with all the functionalities that a B2B and B2C business requires to run online. The software is a means to an end, and that end is creating relationship between businesses and their customers. SAP Hybris delivers a consistent and relevant experience to customers across every channel and on every device. Everything Hybris designed, is to simplify the experience for customers and for business.

SAP-Hybris uses façade design pattern to develop B2C and B2B applications. The front-end or presentation layer is the layer to which all the users (like customers, administrator, managers etc.) interact with. It contains all the web pages and controllers that are responsible to handle all the requests made by client. The presentation layer makes a call to façade layer which in turn makes a call to service layer. The façade layer acts a bridge between which gets the data from different services, converts the model object in to a single data object and sends the data object to presentation layer. The service layer contains the business logic which manipulate the data received from persistence layer. The persistence layer contains all the resource models; a resource model is mapped as a row in database. In Fig 3, the architectural overview of SAP-Hybris has been shown.

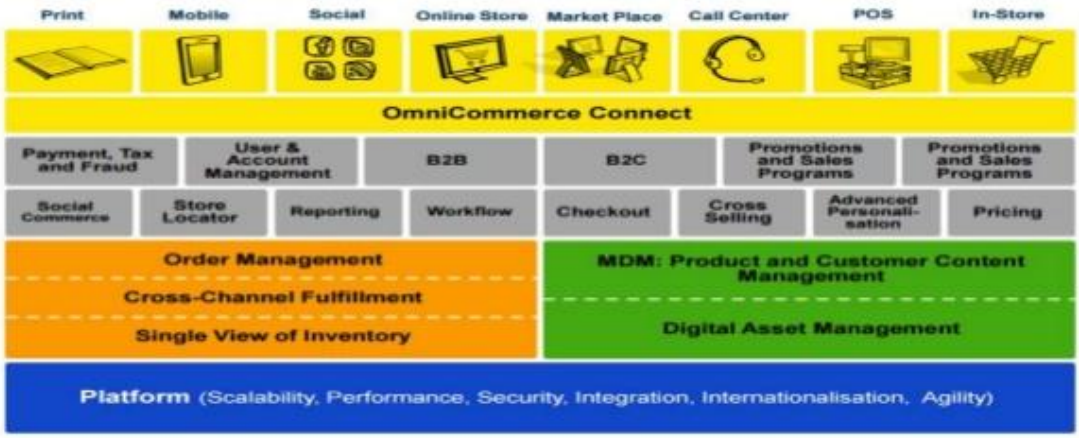

Fig 3: SAP-Hybris Architectural Overview

3. COMPARATIVE STUDY

There are lots of other platforms that are being used for e-commerce development now-a-days. Some of them has been taken into consideration for comparison because of their popularity in B2C and B2B e-commerce.

We can compare the platforms based on their features they are providing like development of websites, customer experience, multichannel supports like mobile, desktops, tablet etc., ease of adopting the technology and helping the business to run smoothly and grow on Internet. Every platform has its own merits and demerits, let's take a look on those aspects of the mentioned platforms:

3.1 Magento

It comes with the following features that helps to run your business smoothly [21, 25]:

a. Magento is open source, you can install, modify or use its Community edition in any manner you like.
b. Magento provides marketing, promotions and conversion tools that help you to up-sells, cross-sells, flexible promotional pricing and coupons restricted to stores, categories or products, newsletters etc.
c. Magento is 100% search engine friendly. It helps to create search engine friendly URL's that make your websites popular on the web.
d. Magento provides you one Administration Panel to control your multiple stores and websites with sharing of as much or as little information as needed.
e. Magento has open system architecture; a Magento specialist can therefore help to create appealing and highly unique user experience corresponding to different types of access devices.
f. Integrations of third party applications like payment gateways, database applications, shipping, shipment tracking etc. is quick and easy.
g. Magento supports Mobile commerce as well so that user can have superior mobile shopping experience.
h. Magento is highly performable in terms of page load speed, query processing time and other such performance parameters.
i. Magento provides the functionality to merchant to enable reward points feature that provide some incentives to frequent shoppers.
j. Magento helps the customer to create multiple wish lists and move their products from list to list.

There are lots of other features that Magento provides you but still it has below mentioned problems that users have experienced:

a. Although Magento is highly performable, but still it doesnot work on standard 8 MB but requires at least 20 MB to work properly (PHP requirement to run). Users have complained that it is relatively slower than other e-commerce solutions. The reason may be it's not effectively written on PHP Zend framework.
b. Customization is not that easy as with other shopping carts. Built on Zend framework and MVC approach, a good developer will take time to bring the changes.
c. Unusable in shared hosting environment and requires some amount per month for hosting as you need a semi-dedicated VPS server. Also, it requires a good hosting environment and store management in order for Magento to run smoothly otherwise you may experience problems with speed.
d. In case of B2B, there is no built-in quotation process where customer asks for quotations of products to merchant.
e. Integration with ERP systems is complex task.
f. Magento is purely for B2C and for B2B, it requires third party extensions to integrate, no OOTB support is provided.
g. Technical documentation is available in limited space which makes it difficult to customize and modify the program.

3.2 BigCommerce

BigCommerce is also one of the most popular e-commerce solution with following features [22]:

a. BigCommerce offer more than 100+ responsive OOTB templates which can be used to create beautiful, intuitive e-commerce website.
b. It offers its own code libraries to build a completely custom online store over the industry-best theme framework.
c. BigCommerce has a global network of more than 2,000 designers and developers who can help to build the ultimate store for business and also to migrate stores from other platforms to BigCommerce without loss of data within minimum timespan.
d. BigCommerce has built-in M-commerce support in its templates. The store will look and perform

equally well on desktops, tablets and mobile phones with no extra coding or design work.

e. BigCommerce allows easy integration with Paypal and other payment gateways, integration with several e-newsletter services and other third party tools.
f. BigCommerce has a feature to send automated reminder emails to people who abandoned their carts at checkout.
g. BigCommerce provides the advance features like custom pricing, customer groups, product-level discounts etc.
h. It provides built-in inventory management as well as integration support with third party vendors.
i. It has its own B2B tax solutions that can be used to manage the taxes and accounting.
j. BigCommerce is built to handle large and complex catalogs, with support for a high number of SKUs, product options and variants, and catalog customization via our open API.

BigCommerce has the following disadvantages [26]:

a. BigCommerce is not an open source, it provides some packages that can be used to create online stores.
b. BigCommerce provides the non OOTB functionalities in terms of app which needs extra cost.
c. BigCommerce charges transaction fees, the additional fees paid to the platform as a percent of sales.
d. BigCommerce doesn't provide any mobile apps to manage stores on the go.
e. BigCommerce has placed limits on annual online sales, if that limit exceeds, then plan needs to be upgraded.
f. BigCommerce lacks in bulk ordering where multiple products can be added to cart in one go.

3.3 ATG

ATG has the following features [27]:

a. ATG allows businesses to personalize their online content, promotions, e-mails, and entire multi-channel marketing campaigns.
b. ATG has advanced facet search feature which support 25 languages, industry-specific dictionaries and misspelling corrections that helps website vendors to find a desired product.
c. ATG helps business to grant access rights to marketing specialities, developers, managers and other group of users to maximize website(s) performance.
d. ATG allows business to accept all major credit cards, integration with Cybercash, PayPal, Google checkout and much more.
e. ATG provides automated tools to calculate the order's price including taxes, delivery options, coupons, gifts and discounts.
f. ATG provides a customizable pre-built storefront that decreases the time of the production environment launch.
g. ATG helps business to manage multiple websites via a single instance.
h. ATG supports order processing and fulfilment tools which include multiple payment, delivery and shipping options, order confirmation messages, administrative management tools to view order status etc.
i. ATG provides multiple options to browse online catalogs. Find the item or group of items based on their IDs, description, date of adding to the website, etc.
j. Abandoned Order Services Module allows Oracle/ATG Web Commerce to detect, respond to, report on abandoned orders and related activity and, subsequently, e-commerce businesses to analyze and improve shopping cart abandonment rate.

ATG has the following drawbacks in e-commerce development:

a. ATG takes more time and cost for implementation of B2B in comparison of other platforms.
b. Creation of new modules in ATG is very complex tasks as the folder structures need to be created manually.
c. If the remote system is unavailable, then no form of the data is available to the ATG web application.
d. Frequent queries to the remote system can affect the performance of the remote system as well as of ATG web application.
e. There is no support for local system to keep in sync with remote system that may lead to data conflicts.
f. ATG takes specified amount of initial time to set up and linking with other application servers.
g. In case of promotions it's not feasible. The more promotions a customer has in his/her profile, the longer it takes to generate a price for that customer.

3.4 SAP-Hybris

SAP-Hybris has the following features in both B2C and B2B scenarios [24]:

a. SAP-Hybris provides standard e-commerce content pages with multichannel supports (e.g. mobile, desktop, tablet).
b. SAP-Hybris provides guest and express checkout for B2C and multi-step or express checkout for B2B.
c. SAP-Hybris provides full text search capability and integration with Apache Solr.
d. SAP-Hybris provides the feature to manage customer accounts and order history.
e. SAP-Hybris provides reporting and analytics integration to keep an eye on business.
f. SAP-Hybris provides customer quote negotiation and special pricing as per the customer groups.
g. SAP-Hybris features cross and upsells of compatible accessories, bundling of products and services, management of digital and physical goods package etc.
h. To cover the e-commerce in china, SAP-Hybris provides china accelerator which comes with china specific style page templates and components.
i. SAP-Hybris provides third party integrations for payments and integrations with backend systems for data exchange while keeping them online or offline.
j. SAP-Hybris features the creation of custom themes, support for multiple languages, supports for multiple stores on a single server as well as using different servers for single database.

SAP-Hybris has below disadvantages [28]:

a. CMS-cockpit has been claimed as slow and inefficient, which can be a drawback especially when content has become a key to a websites SEO/Marketing success in recent years.
b. SAP-Hybris is quite costlier for implementation of e-commerce in comparison to other platforms.

c. SAP-Hybris lacks in its analytics, reporting and order management capabilities.

4. CONCLUSION

The Internet has been so well established and has taken a huge place in normal life that the business must be transformed from traditional channels to the online channels. E-commerce is the solution to help in growing business from a small limited regions to large regions. To do the business online, one must identify the right platform to grow its business. Generally, there are two kinds of business; B2C: where the business reaches to consumers and B2B: where the business reaches to intermediate buyers or different businesses. In B2C, where the business focuses more on its consumers and their experiences, while in B2B, business focuses more on long-term relationships, specific deals with customers, schedule and setup in place with an e-commerce business.

Keeping the above things in mind, for B2C business models, Magento is best choice as it takes less cost and time to implement as well as provides good customer experience, SEO/Marketing related contents. For B2B business models, SAP-Hybris is best choice as it provides all the B2B related functionalities OOTB, just need to add the extensions or need to install the add-ons on the store, apart from this it helps to customize complete process as well, if business requires. The world is changing day-by-day by adapting the digitalization and the new technologies, seeking this thing, everyone focus to attract the customer and look for enhancing their business. In future, SAP-Hybris is adapting the changes suggested by their partners/ customers in B2B and B2C markets that would help SAP to be the leader organization in the field of eCommerce.

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