Customer Relationship Management in Small Business through Cloud Services- An Innovative Approach towards Software as a Service

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Abstract – Nowadays, most of organizations are approaching towards the best solution to improve their business processes by utilizing the advantage of technologies, which are always developing to replace the mistake of traditional version, one of the most critical evolutions in technology system is Customer relationship management (CRM). CRM stakeholders who implementing CRM system or plan to implement CRM system had faced a lot of uncertainty in new technology, in this case, our focus is on CRM as a Service solution as well as security. CRM as a Service is CRM system that applied software as a service (SaaS) technology as a concept of cloud computing. It is a web-based application that hosted CRM application in provider's side, where clients can access to one copy of application by web browser through internet. To investigate the improvement of CRM, we tried to evaluate SaaS's benefits and drawbacks that assume to affect CRM as a Service solution. In this paper, we are trying to acquire a better understand in benefits and drawbacks of CRM as a Service which applying the SaaS platform to improve CRM performance, it is helpful to evaluate the CRM as a Service in SaaS's benefits and drawbacks aspects by considering the CRM experts perspective, it help the IT investors in organization, who plan or approach to on-demand service, to gain more knowledge in CRM on-demand service, and in long run to make right decision in CRM solution to their companies. In addition, the cloud solution should offer scalability to the user, so that in peak-load situations, additional resources can be instantiated relatively easily. A major concern of cloud-based solutions for organizations, is the fear of losing or exposing confidential data. Since the cloud solution is hosted outside an organization and data is stored within the cloud, organizations fear they might lose control over their data. In this report we consider a BPM architecture in which parts of a business process are placed in the cloud and parts are placed on-premise. In this article we implemented two concepts one by separating and keeping data storage in on-premise and software being implemented in cloud. The second is development and implementation of customer home delivery system automation. It is practically implemented and used in LOCUS MEN'S EXCLUSIVE WEAR, Dindigul.

Index Terms – Customer Relationship Management, CRM as a Service, CRM on demand, Cloud computing, Software as a Service and On-demand software, SaaS's benefits and drawbacks.

1. INTRODUCTION

Nowadays, running a business is a daily challenge. Every manager needs to solve problems as fast as possible. Taking advantages of IT is the best solution to succeed when dealing with new challenging experiences. Small and Medium-sized companies are on the front-line to solve different issues that can be harmful for their business. They must focus on their business while trying to devote all energy to solve inner problems. Optimizing all the processes in the company and concentrating on their real purpose is the best way to thrive.

The emergence of cloud computing is potentially one of the major progress in the history of computing. However, companies must have a clear understanding of the situation and the multiple issues they can encounter when using this new technology. All kinds of companies are relentlessly cost-focused. Investment must be well thought to be profitable. Controlling costs is a tough process that is why buying services instead of long-term acquisitions is seen as a better solution [1].

Cloud computing, and more precisely Software as a Service (SaaS), is exactly the same. The service is seen as an on-demand service, the customer pays what he is using [2-5]. Thus, this solution is more profitable for SME that are not able to invest in expensive and complex computing infrastructure. Moreover, SMEs are growing fast, they need to adapt quickly in order to remain onto the market. Cloud computing can be the answer with the pay-as-demand model and the adaptation could be realized on a short-term period. As a matter of fact, Customer Relationship Management has always been one of the most important concerns for all managers. Consequently, constant efforts are completed to alter and improve the characteristics of this promising field. Therefore, we believe this thesis will show interesting facets by mixing these three topics such as cloud computing, CRM and SME.

1.1. Cloud Computing

Cloud computing is a relatively new concept in the IT business as well as in the companies likelihood [6-9]. The best way to

comprehend a new concept is to have a precise overview of the current market. According to a study realized in 2008 by IDC, the cloud software are more and more common. This new computing paradigm can be divided in three categories:

Software as a Service (SaaS): is a software solution usually distributed through Internet and used within a web-browser. As soon as the software is used, the update is automatically made [10]. This kind of solution is the most SME's oriented because it is one of the easiest and the fastest one to implement. As an example, the widespread SaaS solutions are, among other things, Dropbox (web-sharing files and folders) and Google Docs (web-sharing documents).

Platform as a Service (PaaS): is a development system solution where the developers can create an entire environment through API's (Application Programming Interface). The entire configuration can be made remotely and the PaaS offerings facilitate deployment of applications. This solution provides all of the facilities required to support the complete life cycle of building and delivering web applications and services [11]. Examples: Azure from Microsoft, Force from Salesforce or Google App Engine from Google.

Infrastructure as a Service (IaaS): is the lowest level of service available in the cloud. It could be summarized as an entire computer that is at the company's disposal 24/7. This management can be made remotely though different API's or with proprietary software. This solution offers the most flexible service but is also the most complex to administrate. Consequently, financial means must be higher. Examples: EC2 from Amazon or Windows Live Skydrive from Microsoft.

1.2. Public, private and hybrid cloud

The cloud can be divided in three categories. It is important to make the differences between them since the required infrastructure is different for almost every company. A cloud solution could be seen as warehouse where all your data are stored and are accessible in real time. This storage space could be in house or provided by a third party. The Customer Relationship Management mainly use a public solution provided by the software vendor. It is easier for the provider to maintain the system up to date when it is its storage. The company using the service does not have to worry about the servers maintenance can save a significant amount of money avoiding this costs. The only alternative where a SME would like to use its infrastructure is when the company has already one. This way, the investments realized before in order to have private servers can be utilized. Additionally, a solution can be built on the existing infrastructure and using a cloud provider. It is called hybrid cloud. For many investors who already have in-house structure, this solution is the most reliable on a long-term point of view. It is easier to understand with Figure 1 [12].

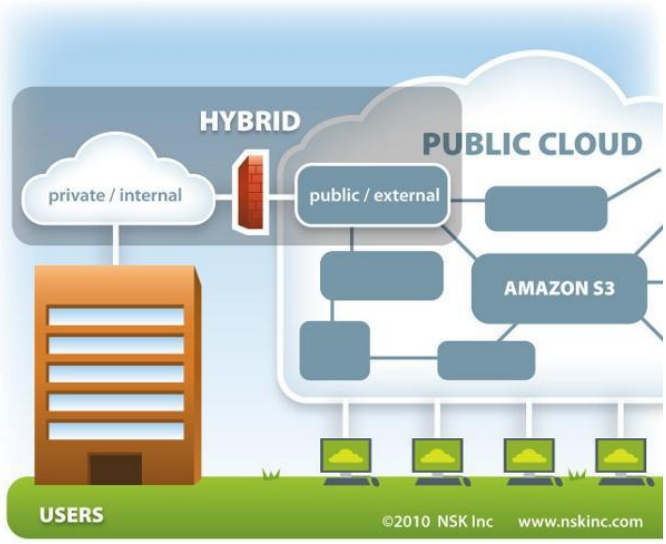

Figure 1 - Public, private and hybrid cloud (NSK Inc, 2009)

Concerning the Customer Relationship Management, the three solutions can be available and it depends on the existing infrastructure, time and money the company would like to allocate to the project.

1.3. Customer Relationship Management

A CRM service (Customer Relationship Management) can be defined in many different ways. Basically, it is a tool that permits a company to build, manage, and preserve customer relationships.

In a general view, CRM is a tool that permits a company to establish, develop, and maintain customer relationships in a long-term orientation. It enhances relations between customers and suppliers and also between two suppliers. CRM helps a company improve its customer orientation, as it is necessary for the company's realization and profitability.

Moreover, a CRM can be classified into two categories: Strategic or operational [2].

The strategic CRM is defined as a process that provides detailed information about the customer. It identifies and creates customer knowledge. Thanks to the CRM, the company will be able to build customer's perception of the company and its products. It will therefore get a complete notion about its customer, its behaviour, needs and wants.

On the other hand, the operational explanation is different: CRM also helps a company gather customer data, evaluate the customer that has the highest potential, and maintain his loyalty by delivering him more efficiently customized products and services. That is why another side of the CRM [13-20] will be considered: the CRM as a software will be defined as a tool installed and deployed inside a company, specifically depending on its size, its way of working and its needs. The

matter of this software, which perfectly fits with the company's system, is to help identifying, managing, and maintaining customer relationship and database in order to deliver customized product or services. This process would therefore lead to a complete satisfaction and loyal behaviour from the company's customers.

The last perspective which the companies can take advantage from is the customer service field (external). Actually, the CRM permits the company to have individual relationships with their customers. It allows the company to know very well the customers. The enterprise will therefore be able to provide him a customized customer care.

In this paper we use separate clouds for storing data and handling the client request. We have also implemented software for handling client requests. The remaining part of this paper is organized as follows: section II comprises of related works done in CRM with cloud computing. Section III describes the approach and design of our software. The processing of data is explained in Section IV. The various modules used to handle customer requests are explained in this section. We conclude this paper finally with the possible enhancements in future.

2. Related Work Done

Before getting in the cloud for CRM software, we were more focused on describing theoretically the different concept. The following items are the literature that has been reviewed to reach our purpose.

In [21], the article highlights some aspects of this uniqueness and also explores some of the concerns that might be preventing some companies from adopting it. Notwithstanding these concerns, it is argued in this article that cloud computing is likely to prove commercially viable for many small and medium enterprises (SMEs) due to its flexibility and pay-as-you-go cost structure. A case study of a cloud experience by a British SME is also presented in this study in order to further highlight the perceived values of cloud computing in terms of cost and efficiency for real small enterprises.

In [22], Adebanjo. E had presented the success of e-CRM implementation is dependent on how the initiative is deployed initially. This study examines three different approaches to e-CRM implementation by 3 SMEs with a view to identifying commonalities and differences in approaches and how these impact success. The study indicated all three organizations gained benefits from e-CRM implementation although different processes, technological platform and costs were involved.

Kim, W et al [23], had presented that it appears that a wide adoption of cloud computing in the foreseeable future is inevitable, and its adoption will bring about a sea change in the pricing and distribution practices for both software and hardware. There are, however, various issues that will impede adoption of cloud computing. Most of them can be solved. We discuss the status of cloud computing today and various adoption issues.

In [24], the authors give a complete definition of the CRM itself. What is it exactly? What are the benefits for the company? What are the advantages and disadvantages of this tool? The article answers all these.

In [25], the book deals with the conventional CRM, its definition, issues that might be encountered during the implementation, the technical and financial aspects. A useful tool for this thesis since it goes through a comprehensive explanation of the pre and post-implementation of CRM.

Ramdani et al. [26], in their paper proposed a model that can be used to predict which small to medium-sized enterprises (SMEs) are more likely to become adopters of enterprise systems (ERP, CRM, SCM and e-procurement) – Direct interviews were used to collect data from a random sample of SMEs located in the Northwest of England. The model can be used to assist software vendors not only to develop marketing strategies that can target potential adopters, but also to develop strategies to increase the adoption of ES among SMEs.

This list is not exhaustive at all. Many articles have been used all along the reflexion process but those previously mentioned are the strong basis for our theoretical framework.\

3. APPROACH

3.1. SaaS for CRM in SMBs

Many IT providers consider SaaS as a serious alternative to locally installed software. Amongst these vendors, there are hundreds of them endeavored to push SaaS adoption in CRM field. Benlian and two other researchers illustrate their analysis of different types of SaaS-adoption levels in 2008 and 2010 for both Small and Medium Businesses and large enterprises [27]

Salesforce.com was ranked number 27 in Fortune's 100 best companies to work for in 2012 with its "social enterprise" strategies. However, its pronouncement also limits its goals and targets to providing services commonly for large enterprises. It is widely accepted that there are plenty of potentials and possibilities in SaaS adoption for CRM in SMBs [28]. Nowadays, more and more SMBs are involved in this revolution [29].

3.2. Web Development Concern

Software as a Service development, according to what devices to be used as endpoint access devices, can be divided into Desktop/Laptop oriented SaaS development that is essentially web services development, and Mobile SaaS development. When referred to Desktop/Laptop oriented SaaS, the author means to refer to that the services are accessed and used throughout a web browser. Similarly, Mobile SaaS are

deployed as a mobile app in mobile devices. Due to the limitation of the scope of this paper, Drupal Content Management Framework (CMF) is chosen for the SaaS application development. That is, this paper will concentrate on using Drupal to develop a web oriented SaaS application that would suit the context of home delivery business operation in a small showroom, even though some methodologies and tools used during system analysis and design can and will be used for other types of development patterns, mobile services for example, in the future.

3.2.1. Availability

The second reason for choosing Drupal is that it is an open source content management system. The main concern moving to the cloud is to reduce unnecessary costs. Using a free Open Source CMF as the back-end framework benefits both IT project managers and service end users.

3.2.2. Flexibility

Comparing to other popular free open source Content Management Systems (CMS) such as Joomla! and Wordpress, Drupal is relatively developer-friendly. Besides, it is more powerful to scale up massive distributed websites, which perfectly suits the requirements SaaS and cloud computing ask for.

3.3. Design

Although other parts of business operation such as human resource management, material stock management and financial management are of vital importance in retail shop management, this paper will focus strictly on Customer Relationship Management and enhance of such management work by using SaaS application services. As a witness of the whole process of establishing door delivery business and the main executive of the garments delivery work flow in a relatively new introduction, we particularly cares about issues of making this work easier. It includes:

1. Transforming manual paper system to computer-based information system;

2. Storing customer information into computer database;

3. Retrieving database information anytime anywhere;

4. Conveying delivery information via Internet.

Door delivery business operation is more about Customer Relationship Management than any other selling activities occurring inside retail shop base in garments businesses. This is because customer information is of great concern in door delivery business operation for connection between the two ends, customers and garment showroom. Purchase in a showroom requires less information, for instance, a home address to be left. However, such customer information is crucial for home delivery. For this reason, a series of problems has been identified as follows:

Applicability concern:

- Some customer information can be so important to customers that some of them may not be willing to leave it;
- If customers doesn't want to leave much information, how to still make business connections;

Security concern:

If customers trust the showroom dealer and give enough information, how to protect these customer information;

The importance of working out these problems so as to improve garment showroom management level is therefore highlighted. These problems lead to a result of careful selection of customer information. What to take and what not to take is then ultimate solution to take great care of customer information and manage business connections between sellers and buyers. Home delivery business flow is very simple. Buyers need to call sellers for ordering and sellers might have to call buyers when buyers cannot be reached for some reasons. In addition, location addresses need to be determined and agreed so that garments can be delivered and business deals can be accomplished. Hence, phone number and location address would be two musts when collecting customer information. Thus, for Issue 1) mentioned in the previous page, when converting manual paper system to computer-based system, phone number and location address are two required fields to be taken and recorded while others can be optional. As a successful migration to computer-based system, the three following issues mentioned in the previous page are just a matter of system architecture of such information system. As mentioned previously, locally installed softwares and packages have several disadvantages such as less mobility and overdue deployment. These weaknesses become more and more obvious after the rise of cloud computing and Web2.0. The SaaS application prototype in this document aims to address and try to solve similar issue. Home delivery business operation is handled by paper-based system in the past, and a number of problems are derived from this old system. Such problems include:

1. Seller has to ask buyers' general information over and over again, even if buyers have ordered before but valuable information is ignored as those papers for recording have been thrown as rubbish, or it becomes a difficult task to maintain as they accumulate more and more.

2. Knowledge management is well known as an important part of business operation. However, mistakes cannot be avoided occasionally. When salesman makes mistakes especially about location addresses, workflow would be hindered and resources such as time and money are therefore wasted. Likewise, new

workers involved know nothing about previous ordering information and it becomes really hard for them to manage their work properly.

3. Information communication is as crucial as knowledge management during business operation. In home delivery business operation there are typically three workforces involved: Reception Desk, Manger/Boss and Delivery Person. For the last participant, general information has to be given in order to make his/her work more fluent. Example of such information might be new orders coming in while transporter is still driving on the way.

3.4. Design Evaluation

In essence, the functionality, completeness, consistency, accuracy, performance, reliability and usability of this SaaS application would define the overall design evaluation of itself. Specifically, this research will study the applicability of the SaaS application for a purpose of effective and efficient way of working. To achieve a good result of design evaluation, modeling and design of the application should meet business needs in home delivery business operation.

3.5. Class Diagram

To formulate a class diagram in home delivery business operation, objects that are considered important are Sales man (S), Order (O), Customer (C) and Delivery person (D).

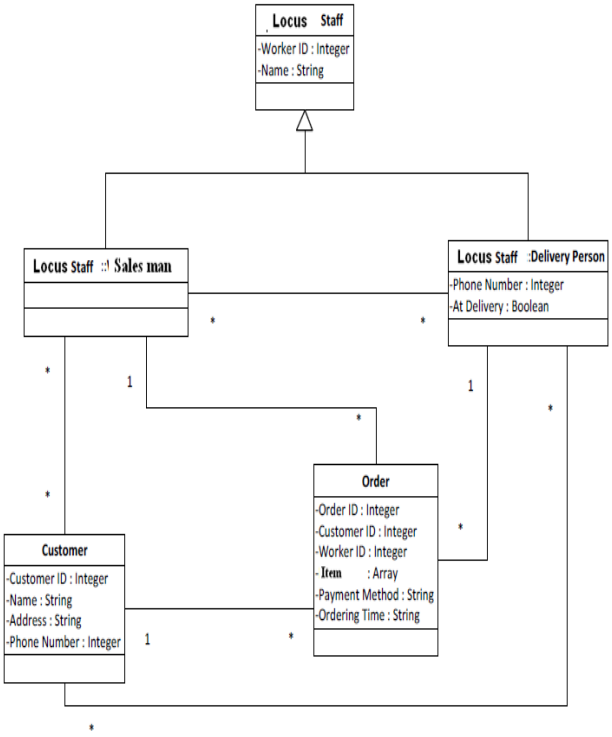

FIGURE 2. Class Diagram for CRMDD

Figure 2, presents five classes within which four of them are of vital importance, while Class Locus Staff is only performed as generalization of Sales man and Delivery person class. Each of these five classes has a primary key, while Class Order has also foreign keys to refer all attributes of class Customer and that of class Sales man or Delivery Person. The relationships between each other are as follows:

1. Class Locus Staff is composed of Class Sales man and Delivery Person;

2. One Sales man would link to many delivery person, and one delivery person may talk to different shift-working Sales men;

3. One Sales man may receive phone call from many customers, and one customer may order from different shift-working Sales men;

4. One delivery person may deliver orders to many customers, while one customer may get delivery from different delivery person as well;

5. One customer may make many orders, but one order is made by only one customer;

6. Similarly, one sales man may record many orders, but one order is recorded by one single sales man;

7. Also, one delivery person may ship many orders, but one order is shipped by one particular delivery person.

4. Implementation

4.1. Implementation

After all systems investigation, analysis and design have done, the following text describes implementation of such a system. As mentioned before, Drupal CMS is used as the Content Management Framework for the CRMDD system implementation. However, this paper is not a how-to tutorial, thus the author is not going to introduce how to program with Drupal gradually. Instead, the following text tries to provide two most crucial modules that has developed and added to Drupal to fulfill the system requirements in order to meet business needs, though, there can be millions of possible ones to be made.

4.2. Module for Order Information

Drupal modules are plugins for Drupal that extend, build or enhance Drupal core functionality [30]. As illustrated in the previous sections, entity “Order” plays as one of the most important roles in home delivery business operation. Thus, the first module provided here is a module that offers several functionalities including:

4.2.1. Administer order information

For Administers such as Manager/Boss in a showroom, they might need full control of the CRMDD Management system.

This functionality would give them possibility to manage fields of order information they would like to take by ticking link as presented in Figure 3.

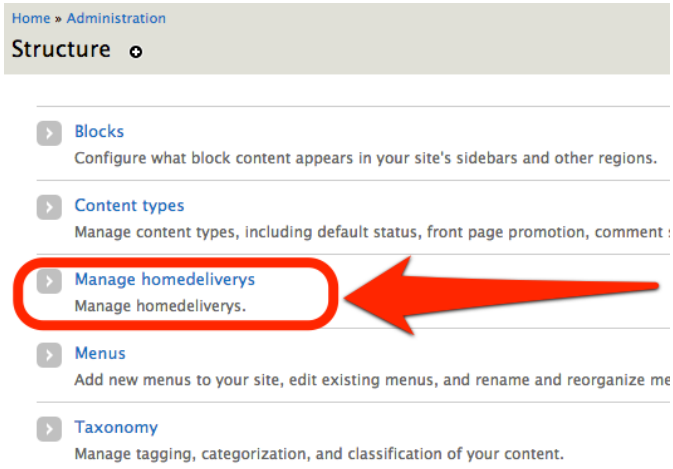

Figure 3. Access Point for administering order information.

Based on Entity-relationship diagram presented in the previous section, attributes such as customer name, address, phone number, item kinds and payment method in Class Order are demonstrated as shown in Figure 4:

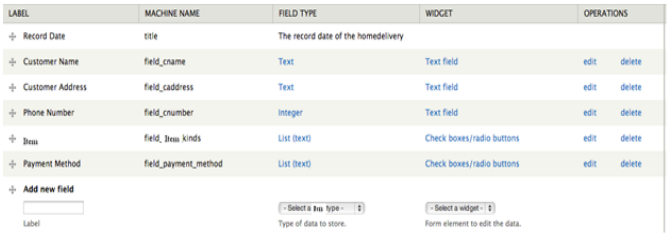

FIGURE 4. Administer order attributes.

Overall, this functionality would define possibility to administer order information for manager/boss in home delivery business operation. Moreover, other participants involved in home delivery business operation have not permission to do so.

4.2.2. Record order information

In home delivery business operation, Sales man is regarded as the only party who creates an order in general. Therefore, such functionality would be assigned only to this role and even Manager/Boss would not be able to record an order to make system work constantly. Likewise, link to order information creation form should be presented to Sales man at the first place, front page in the CRMDD Management system, as the following figure gives:

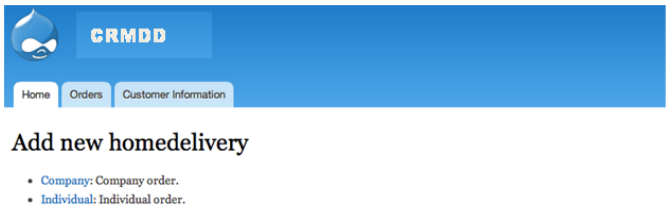

Figure 5. Access Point for recording order information

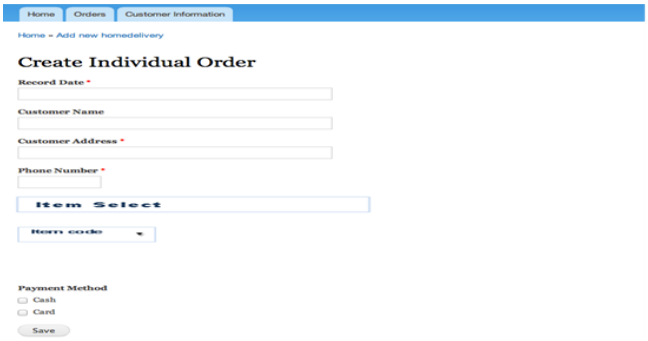

Figure 6. Form for recording order information.

By clicking "Individual" link in this front page, a form for gathering all order attributes of an order made by an individual person is presented in the above figure. After filling up and submitting this form, most valuable information has been added into database for any imaginable late usages. Likewise view order, update order and delete order also are performed. Customer information is the main source and it can be processed on any need. The customer information model is depicted in the following flowchart.

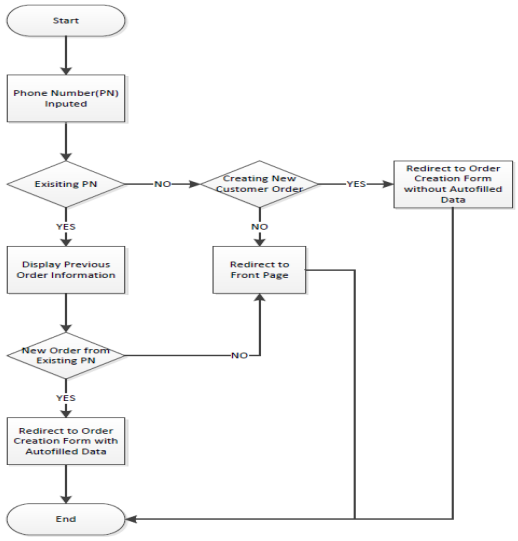

Figure 7. Design Flowchart for Customer Information Module.

4. Conclusion

Home delivery business operation in small garment showroom is one small part of the garments business. However, Customer Relationship Management is especially needed to be taken care of in this small part of the business. Through deep research and investigation in the previous chapters, we found out that customer information and order information are important in retaining current business relationships and creating new ones. Thereafter, we concludes a CRM system can help small showrooms in this particular part of business operation.

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