

# New CRM Architecture Adapted To Big Data

Abderrahmane Daif, Fatima El Jamiy, Mohamed Azouazi and Abdelaziz Marzak

University Hassan II Mohammeda, Faculty of Sciences Ben M'sik, Laboratoire Mathématiques Informatique et Traitement de l'Information MITI, Casablanca, Morocco  
*fatima.eljamiy-etu@univh2m.ma*

**Abstract**— The business model as known by the majority of specialists has moved from product concentration to the customer concentration. And as we all know, electronic commerce and generally the world of technology has exponentially believed that principal. In this era, many companies have begun to permeate the Electronic Customer Relationship Management (CRAG / E-CRM) more than conventional CRM to better understand their customers. As early as the first definitions of the CRM, we found among the main three axes - technology - Currently the data world is also outstanding to have a change with the advent of Big Data paradigm. There is a need to rethink and reconsider the validity of existing architectures management of electronic customer relationship.

In this paper, we will see the existing architectures, and we subsequently present architecture with features capable to respect and exploit the new data based on research works.

**Keywords**- CRM; Big Data; e-CR; Architecture

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## I. INTRODUCTION

Customer Relationship Management (CRM) is a business strategy that integrates organizational culture, human resources, processes and technology, to acquire and retain high value customers.

With the most demanding and critical consumers' vis-à-vis trademarks by their access to information, organizations can no longer do without a new reflection on the customer relationship. If the digital revolution and the social web renew the opportunities to enrich the customer relationship strategies, pitfalls are to be avoided to not lose the customer who now does not hesitate to turn to the competition if he finds more advantages.

The customer relationship management handles all aspects of customer interactions. It offers a view on the company's performance and employees and brings productivity. After a good consolidation of all possible data sources within the enterprise, commercial and marketing department can manage profitably the service and targeting of customers and prospects.

In fact, it is necessary to consider the challenges of the implementation of the CRM as justified by the commercial market studies, which have shown that approximately 70% of CRM projects result either losses or no improvement in performance of the company [1]. These negative results are well described in academic and professional level. [2] What we can add is that there are many actors and startups that are placed on the new operating niche of big-data and CRM, but there was therefore a gap between their positioning and state of evolution of their systems due to the rapid development, diversification and heterogeneity of the data available today. This requires a review of the start of the development cycle of these solutions, and review the structure and architecture that

give a clear view of the modules and the possible interfaces between them.

It is in this sense that we started our research on managing the customer relationship, precisely the part of the recommendation, and in this paper we have made a study of some existing architectures of the main market industries and we proposed our own architecture which will include a module with features that could add value to the final results of an electronic customer relationship management system. This paper is organized as follow: in the first section, we will present some architectures, in section 2 we will present our proposed architecture, and our document will be concluded in Section 3.

## II. PRINCIPLES AND ARCHITECTURE

### A. Definitions

*CRM* :

- Customer Relationship Management is a set of tools and techniques that: Conduct an historical points of contact of a customer or a prospect with a company
- provide support to customers interactions management through appropriate tools
- store structured information on these customers and prospects
- Re-use this information to optimize the next customer contact

The CRM is based mostly on technology tools to process large amounts of data on customers disseminate this information and automate some of the exchanges. However, it is not just tools, it is a project management, substantive policy

which often requires changes in the structures and business processes [3, 4].

*Social CRM:*

The Social Customer Relationship Management is a business strategy considered as a natural evolution imposed by the new social customers in the sense of creating a bilateral relationship between the customer and the company [10]. It can be conveyed through different technological platforms and customer relationship tools such as a CRM system.

Consumers took power on social networks and brands within thousands of simultaneous conversations of these "consum-actors" who seek to intrude.

*B. Architectures*

Studies of architectures and CRM conceptual models [5] [6] [8] show that there is a resemblance and similarities between the CRM global architectures. The Figure 1 shows the layers CRM:



Figure 1. Conceptual layers of CRM

The technology architecture and internal and external business processes are the critical part of the system. And following an official publication of HP [7] and that of Gartner, there are three classes of technologies:

Thanks to new communication technologies, collaborative technology allows customers to interact with the organization (Meta Group, 1999). This provides central communication and coordination network or the main links between the customer and the entire supply chain as suppliers and / or partners (Xu and Walton, 2005: 961). It also represents a point of contact between the customer and one of the other communication channels [11]. It may show as portals, or center of interaction with the customer.

This class is the backbone of the development of e-CRM [12], which is centered on the Web. It allows companies to have more contact with their customers across intranet, extranet and mobile applications.

Today, the new CRM technologies must be adapted and re-think to have the ability to interact with new channels and collect data of different types and different sources by following this opaque wave of Big Data.

*Operational Technology*

Represents all the internal order of business applications and customer-driven, and enable to automate and manage:

- The marketing plan (contact management, track leads, opportunities and companions)
- Sales source of different channels as well as the rest of the process.

Sales forces (registration of visits and surveys, marking potential customers)

The customer call centers are also an operational CRM component and have been identified as the dominant aspect in CRM systems (Xu and Walton, 2005: 960; Anon, 2000). All customer interactions are recorded allowing the agency to collect data on the customer and thus follow the customer (Xu and Walton, 2005: 961)

*Analytical Technology*

We can say that without this class the data will be useless since the data collected are unclean, and that policy makers cannot make an interpretation to an amount of data that does not cease to increase at a significant rate in recent years, hence the need to have the tools to process and analyze that data. Analytical CRM involves the capture, storage, retrieval, processing, interpretation and presentation of customer data stored in data warehouses (Xu and Walton, 2005: 961)

The analytical part of CRM includes data marts or data warehouses such as customer databases that are used by applications that implement algorithms for cutting the data and display them in a form that is useful to policy makers [6].

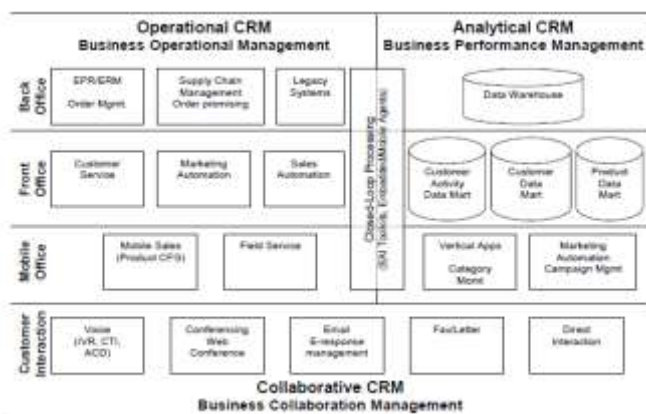


Figure 2. Classes of technology

*Collaborative technology*

As mentioned above for collaborative CRM, analytical CRM can be enhanced through use of new types and amount of data, while putting the focus on the creation of the competitive value for the company [9] and improved sales and customer loyalty.

C. Industrial architecture

In this part, we will present some architectures of specialists industries in this segment [7] [11] [12] and we will finish with a proposal in section 4.

ORACLE



Figure 3. CRM Oracle Architecture

Oracle launched on the market the Siebel product as a more feature-rich solution that is designed for several industries. The figure below shows the application component elements, but basically, if we analyze the grouped elements (rectangles), we see very well the presence of three technologies classes. Siebel 8.1 has the Siebel user interface, which can be analytical, highly customized embedded uses, and focused on the task.

SAGE

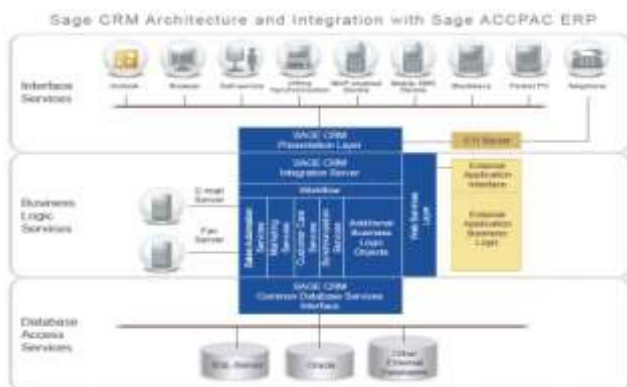


Figure 4. Sage CRM Architecture

Sage CRM, however, is powered by a pure Internet architecture that surpasses client / server technology which is an advantage today. As shown in the figure below, the CRM

Internet architecture includes three distinct layers that communicate using Internet standards (Interface services, business logic services, database access), but in fact is the analytical part injected into the operational part that allows to export data to other advanced analysis tools [13].

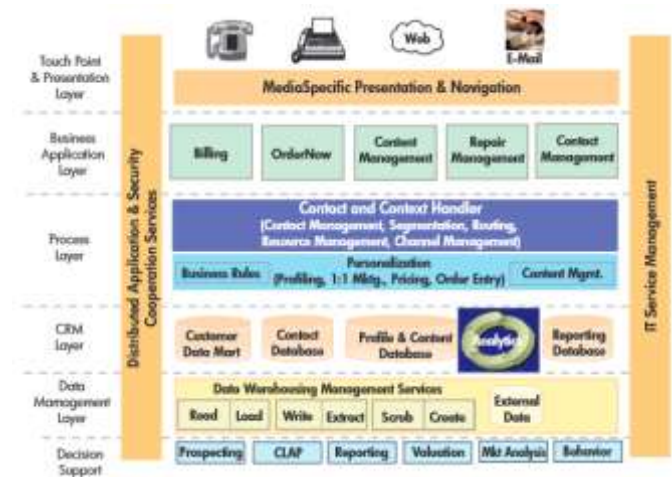


Figure 5. HP CRM Architecture

HP CRM

The same as other industries, the model of HP is represented in the form of six layers, starting from the highest layer, we'll have a match still in three classes, the first and second layer represent collaboration technology ; the third layer for the operational technology and the last three layers are the analytical technology. If we scrutinize these architectures we have the same remarks made on [6] which concluded that for a global visibility we end up with a named representation: three envelopes.

D. Model three envelopes

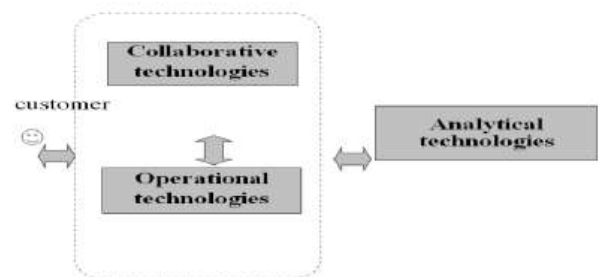


Figure 6. Model three envelopes

This architecture is simple and clear without doubt vis-à-vis the connections and interactions between the three envelopes, but how these architectures can operate with the Big Data paradigm? Are they able to interact with new solutions on the market?

### III. PROPOSED ARCHITECTURE

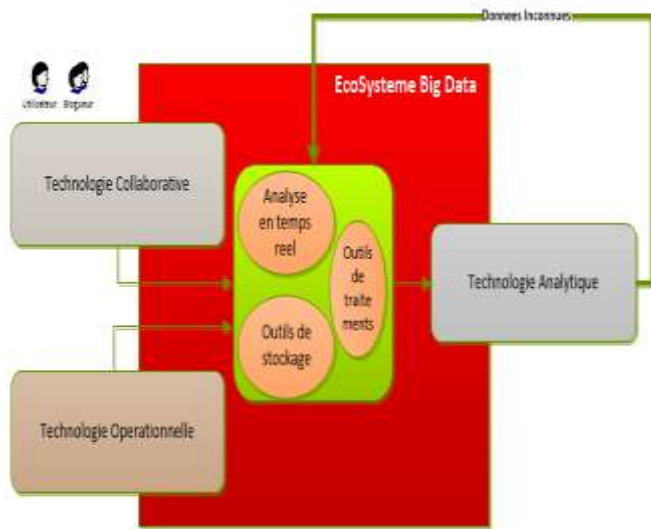


Figure 7. Proposed architecture

In our architecture we have added a whole module as illustrated in Figure 7, which represents a big-data ecosystem that will have as main task the preparation of data to be processed converged with other existing and those baptized unknown, which are actually the results of previous interpretations; while respecting the maximum possible five V (Velocity, Variety, Accuracy and Value, Speed).

We have made a design with three main sub-modules: real-time analysis, storage tools and processing tools. These three modules have a complementary relationship, it means that for the processing of these data (excluding the techniques and algorithms used) and the additional in real time we need special and adapted mechanisms in terms of storage. The synchronization between these three sub modules will be the key to perfect the overall interpretation process of the 5V data. If we break these three modules, we will see that the complexity can decrease by collaborating, technically speaking, between the types of tools available (analysis, storage, processing) such as hadoop, pentaho, Hbase, MongoDB .... This module will be as a complex platform that malaxera between the solutions that have weighed in the fields of processing and storage of data as well as new models of CRM, namely: Social CRM and Open CRM. The interaction and data analysis of social networks, blogs, customer reviews will create value to enrich and eventually improve the product and recommend (draw satisfaction) at best, thanks to Client-a-customer experience based on analysis of web data by any of the existing methods, citing as examples to be sentimental and social listening to new data.

### IV. CONCLUION

In this work we have made a comparative and synthetic study of architectures offered by industries of the field and we have proposed an architecture that will incorporate a layer or ecosystem for the big-data and consequently cover the need to create more competitive value and follow current trends.

The research may be continued on the technical integration of available tools in the market, taking advantage of the strengths of each and assess the added value of the knowledge extracted.

Our architecture is based on girls architectures of large market industries and it will be more enhanced while taking into account the evolution of the aforementioned tools at the mercy of events and technical developments.

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