

A Framework for Implementing Cloud CRM System at Five Stars Al-madina Al-munawarah Hotels

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Abstract

Cloud customer relationship management (CRM) has become a hot topic amongst applications and researchers; researcher pays more attentions to cloud computing application in customer relationship management (CRM) field. This study provides a conceptual framework to assist decision makers in determining and implementing factors influencing on cloud CRM implementation at five stars hotels in Almadina Almunawarah. For testing proposed model researcher utilize questionnaire instrument to collect and analyze appropriate data. Then to validate data researcher use advanced statistical techniques e.g. factor loading; correlation; standardized regression coefficients to observe fitness of the proposed model. Last section researcher suggests an additional state of the art cloud CRM challenges. The findings of the study indicate that security, vendor management, customization, ease of use, and IT staff skills play an especially critical role in success implementation of cloud CRM at these Hotels. It was also determined that the most important challenges to hotels sector are: lack of senior management awareness of cloud technology, availability, and reliability, security and privacy, limited scope for customization, IT staff skills, vendor management, cloud transition and execution, and the lack of cultural readiness.

Key words: Cloud computing; CRM; Implementation model; Five stars Hotel.

1. Introduction

Cloud computing (CC) is still emergent as a technological trend style, and it has already begun changing IT industry. Sriram and Khajeh, (2010) elaborate cloud computing were becoming a smart technology due to its active scalability and real usage of the resources; cloud computing can be engaged under conditions where the availability and accessibility of data resources may be limited. A lot of critical success factors had been studied, such as security, vendor management, customization, ease of use, and IT staff skills, etc... Numerous existing applications and techniques used in the cloud computing before the implementation of the cloud computing on CRM system (Zhang, et al., 2010). In the past, firms used enterprise to store the customer information in the core storage of the firms itself. This stored customer information will be private, and it is protected from the illegal usage. On the contrary, in the cloud computing environment, the storage of customer information is available everywhere and every time from the customers' usage and the whole customer's information storage and security protocols will be service provider responsibility (Weiss, 2007). The research applying cloud computing to CRM at Arabian region is not expressively reported. In order to give a complete play for the benefits of cloud computing, in this study, the researcher tried to deploy a framework to CRM systems based on cloud and prepared a key research exploration for it.

This study enlarges to assess the effect of cloud computing on CRM at five stars hotel in Median. Sriram and Khajeh, (2010) clarified "cloud computing services usage the Internet as a media and transform IT resources into services for customers, including software services, computing platform services, development platform services, and basic infrastructure leasing." Cloud computing's major importance lies in permitting the customers to access whole resources through the Internet. Literature finds cloud computing similar to grid computing (Sriram and Khajeh, 2010; Oredo and Njihia (2014), and some literature find matches to services similar to water and electrical power services, literature refer to cloud computing as utility computing (Chengyun, 2010; Zhongze, 2010). The literature covers many explanations of cloud computing, for example, Oredo and Njihia (2014) defined that cloud computing is the incorporation of simulated resources according to user needs, including hardware and flexibility resources, deployment platforms and several applications to make CC services. Hua, (2010) noted that cloud computing might contain the storage of user information and the lack of any need for software installation on the customer's side. Furthermore, the customer is able to link to the Internet, all of the hardware resources in the cloud can be used as customer-side. General is speaking, cloud computing applications are demand-driven, given that various services conferring to customer needs and service providers charge fess instances of use or defined period (Lin and Chen, 2014). Delic and Riley (2009) evaluated enterprise knowledge management architecture as well as applications and how it would become more worldwide, reliable, and well-organized infrastructure with cloud computing.

2. Literature review

National Institute of Standards and Technology (NIST) outlines cloud computing (CC) as an on-demand admission to a pooled of computing components. Mell and Grance (2010) concluded CC as a broad resolution in which all computing components from hardware, software, networking, storage, and so on are delivered speedily to the customers. Pritesh, et al., (2011) noted to reach for shared cloud services, the cloud setting with coherent security police is the required. Moreover, cloud environment may characterize by A spread system where applications are stored in a cloud of servers that can be reached through an Internet connection and a Web browser; expanding the applications, platforms and infrastructures levels; the resources available according to the client need; a tolerance when resources breakdown; a new financial models where customers pay fees monthly; yearly; or per used. Cloud computing is low-priced than other computing models; maintenance cost adjacent to zero and the service provider is fully responsible for the 24-7-365 availability of services. Hence the clients do not need to acquire IT solutions (Farhan and Haider,2011). Wayne and Jansen (2011) suggested three commonly CC service models which are: (1) Software-as-a-Service (SaaS): By using this model firms

can reduce the cost of IT components, maintenance, and post- implementation. (2)Platform-as-a-Service (PaaS): By using this model firms can develop his own application on the cloud provider platform. Firms can manage his required IT components of the platform. The firm has control over applications settings of the platform. Hence, firms can reduce the cost and the IT management trouble. (3)Infrastructure-as-a-Service (IaaS): The provider hosts the firms' virtual machines and provides to them networking facility and storage services virtually through a service interface. Buyya (2011) categorized cloud computing to private; public; community cloud; and hybrid cloud. Private clouds deal with accessibility data to the end-users whom typically pay as service. Public cloud is designed for the accessibility data to the end-users who employ the facilities without any fees. Community cloud shared infrastructure between several firms from an exact community with shared interests, while achieved and hosted internally. Last, hybrid cloud which encompasses two or more clouds "public, private, community" that remains unique entities but are bound together, offering the benefits of multiple utilization modules.

Buyya et al., (2009) pointed the increasing significant of the information, and that should be accomplished as the enterprise expanded. CRM needs a huge investment in technology, and people, especially customers and enterprise, cooperate each other nowadays; organizations force to utilize CRM to analyze the vast amounts of customer information (Rygielski et al., 2009). In general, technology allows customer information collected and analyzed in a unique manner. Many organizations adopt the common category "customer is first" and becoming the central point (Piccoli, 2003). Gurau, et al., (2003) concluded many firms are seeing CRM as a major component of business innovation, and the role of technology are to enable a precise segmentation, customization, and personalization of customers' preferences. To continue in the intense competing, meeting customer needs were attractive for businesses that fully deal with customers like hotel sectors. It is recognized that it takings up to five to eight times added money to obtain a new customer than to get a current customer to make a new buying process. Henceforth, customer retention and extension actually are imperative for hotels because it's serviced sector (Sigala, 2005). Skaates and Seppanen (2009) proposed pyramid of CRM include "people, processes, and technology" to expand the intimacy of the relationship with customers. CRM pyramid arranges movement firms from customer centric to distribute the value of every customer. Andrade (2003) explain the idea before establishment CRM is to facilitate communication and provide steady, high customer services and cost effective facilities to stakeholders. Marston, et al., (2011) pointed CRM contributes sales force more time to sell, allows marketing to better realized. One of the main benefits of e-CRM is the possibility of cloud based; a cloud-based system deliberate to be more dynamic with growing capacity so a business can optimize their CRM depending on current business needs (Sigala, 2005). Generally speaking, the cost of the CRM, which is often based on the number of clients and their needs, is cheaper than purchasing a new system. Buyya, et al., (2008) summarize "in most cases, the scalability process is simple as contacting your cloud CRM vendor." Cloud CRM is regularly a good option for organizations that haven't enough in-house IT expertise to install and upgrade an on-premises CRM application. With applying CRM base on the cloud, the vendor of cloud CRM is responsible for installing and upgrading the software across the system and resolves any raising issues. Further benefits of CRM in the cloud is the integration with operational services and with social data (social CRM) more automated data backups (Venters and Whitley, 2012).

3. Methodology and data analysis

Figure 1. Presented the proposed model, the below variables affecting on cloud CRM implementations. Upon data collected and analyzed from five stars hotels in Almadina Almunawarah region. This study covered information about cloud CRM applications and about the main factors which considered before implementation of cloud CRM at these hotels. Several kinds of literature designed a questionnaire a main data collection for the cloud computing (Kim, 2009; Buyya, et al., 2008; E & Y, 2011; KPMG, 2013; Elais and Mirchandani, 2012; De Vos et al., 2011).

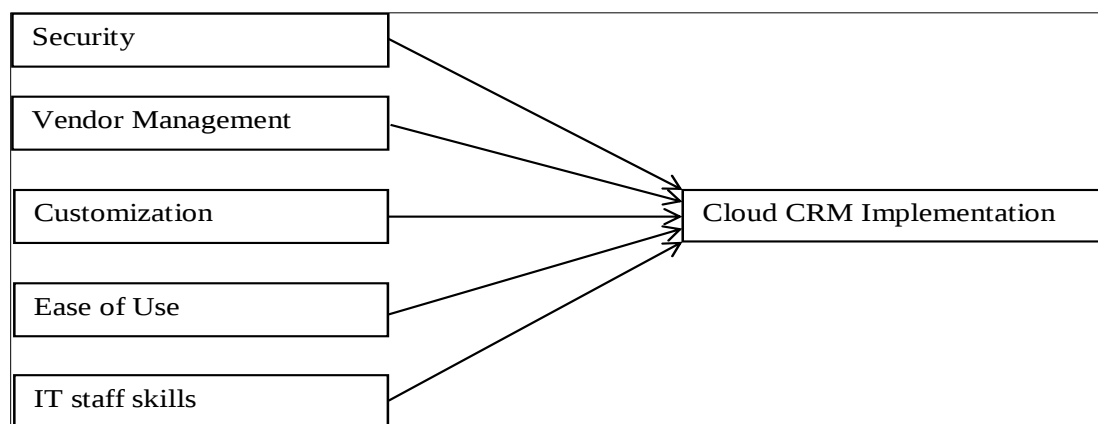


Figure 1. The Proposed model

3.1 Measurement strategy

Factor loading was used to observe the relationships among variables. Factor loading is a technique of data reduction to underlying dependent variables that are reflected in the independent variables. Kaiser and Rice (1974) mentioned many different techniques that can be used to conduct a factor loading such as principal axis factor, maximum likelihood, and generalized least squares. The next steps researcher inspects the correlation matrix- highest correlations show that variables can be clustered into consistent sets of variables, and they are accordingly suitable for factor loading (Hair, et al., 1998; Anderson and Herbertsson, 2003). Examine Kaiser– Meyer– Olkin (KMO) extent of total sampling adequacy KMO for each variable, KMO measure a means to which the show of a hypothesis belong organized, such as a measure of the similarity of variables (Hulland, 1999). Regression analysis was calculated to observe the relationship between variables (Hair, et al., 1998). Furthermore, researcher intended to calculate means (M) and standard deviations (SD) for each variable and correlation scale to investigate the correlation between variables.

3.2 Research sample

A questionnaire was designed to collect information about all managerial level of cloud CRM in addition to characteristics of the hotels; questionnaire contained 20 items, based on five Likert scale-strongly disagree to strongly agree- range. The twenty items of cloud CRM tool had reliability (Cronbach's α) of 0.75 (see table 1). Questionnaires were sent to eight hotels: Meridian Medina; Intercontinental Medina; Marriott Medina; Crown Plaza Medina; Hilton Medina; Shaza Almadina; Leader Almuna Kareem; and Movenpick Medina. The percentage of hotels that responded to the questionnaire was 70%, those hotels were located in Medina. 92% of educational levels of the responders held Bachelor, and 8% had Master's degrees in computer sciences field-Computer Science; Computer Information Systems; Software Engineering; Networking; and others -, respondents occupied a diversity of positions in the IT department. They included managers (20%), deputy managers (20%), IT employees (40%), and other positions (20%). More than 89% of those responding had more than 5 years of work practice.

3.3 Factor analysis of cloud CRM at Medina five stars hotels

The validity and reliability measurements of the variables were confirmed using SPSS21 package. Validity is concerned with the exactness of a measurement, whether a particular survey question is actually measuring what it sets out to and reliability is concerned with whether the survey questions can be steadily interpreted across a variety of situations. Kaiser-Meyer-Olkin measure of sample tolerability was 0.75, in the satisfactory kind (>0.60). Consequently, the norms for loading factor analysis are confirmed according to Hulland, (1999) study. The sample data of 80 answers was studied by confirmatory factor analysis with PCA selected extraction technique and varimax as the rotation method. Twenty two factors were extracted in the non-rotated factor solution with eigenvalues over 1. These twenty two factors clarify 67% of the variance. Two of the items were rejected due to their low communalities in the first rotated solution to enhance the factor analysis. After exploring the residual 20 factors, we obtained five factors taking a factor loading of 0.50 and eigenvalue greater than 1. These five factors explicate 74.5% of the variance, which is a satisfactory percentage. A varimax rotation was deployed which convergent in 10 iterations. The factors with the highest loadings (>0.05) were mainly taken into consideration when naming the factors (Table 1). Five factors were recognized as the core extents causal cloud CRM in the hotel's sector. Reliability was assessed by applying internal consistency (Cronbach's α) of the items demonstrating each used factor. As seen in table 1. Cronbach's α value was ranging from 0.79 to 0.87 for the five variables, each factor loadings, eigenvalues, average variance explained (AVE) and Cronbach's α . Means, standard deviation, and the correlations between the five factors are revealed in Table 2. The exploration of the correlation outcomes presented that there was a significant relation between customization and other two variables (security and vendor management) at the 0.05 level. There was also a substantial relation between customization and ease of use and IT staff skills ($p<0.01$). As a final point, a substantial relation was observed between IT staff skills and other four variables (security, vendor management, customization, ease of use) at the 0.05 level.

Table 1: Results of factor analysis to cloud CRM

Factors	Factor loadings	Eigenvalues	AVE (%)	Cronbach's α
Security(SEC)		5.54	31.22	0.86
Accessibility to data for authorized people	0.70			
Reliability to access data in specific time	0.69			
Reliability to perform critical operations	0.72			
Classify and correct data and knowing how and where data are stored	0.73			
Vendor Management(VMT)		3.37	18.64	0.87
Better respond time "send &receive" Process from cloud provider	0.78			
Low expense of services	0.74			
The scalability of business as needed	0.73			
The scalability of data storage	0.70			
Customization(CUST)		2.22	11.20	0.79
Affordability of integration with the existing architecture	0.67			
Adapt to changes	0.71			
Ability to reconfigure capacity, storage, and servers quickly	0.73			
Cloud fit services more strongly into the setting of their specific business	0.71			
Ease of use(EOU)		4.44	7.87	0.85
Availability of tools and standards	0.68			
Convenient to access to cloud CRM	0.63			
Easier to do the tasks	0.65			
Learning to use the cloud CRM could be easy	0.64			
IT staff skills(ITSS)		1.12	9.75	0.80
Enough and updating training	0.61			
Getting cloud certificate	0.62			
Accept the changing role of IT	0.61			
Contract with third party	0.65			
Total variance explained	71.22			

*Extraction method: Principal component analysis *Rotation method: Varimax with Kaiser normalization *Rotation converged in 22 iterations

Table 2: Means, Std deviation, and correlations of scales

Construct	Mean	Std. deviation	SEC	VMT	CUST	EOU	ITSS
SEC	3.22	0.86	1.000				
VMT	3.01	1.10	0.24*	1.00			
CUST	3.12	0.51	0.30**	0.62**	1.00		
EOU	2.98	1.21	0.31*	0.49*	0.47*	1.000	
ITSS	3.20	0.45	0.22*	0.26*	0.29*	0.27*	1.000

**Correlation is significant at the 0.01 level (2-tailed) *Correlation is significant at the 0.05 level (2-tailed)

To examine the relationship between the above factors (SEC; VMT; CUST; EOU; and ITSS)When allowing for all these variable as independent variables and cloud CRM implementation as the dependent variable, adjusted regression analysis were calculated. The results show that vendor management and security have a substantial correlation with cloud CRM implementation in purposive hotels (adjusted $R^2 = 0.27$). Table 3. shown the outcomes of regression analyses and were acceptable ($R^2 = 0.31$; $F = 9.31$; $p < 0.001$). The inter-relation among the five independent variables was considerable, and the adjusted R^2 (0.27) was considerable at the 0.000 level ($F = 9.31$). 0.27% of the variance in cloud CRM was suggestively clarified by the independent variables. Among five independent variables, vendor management the utmost significant in clarifying cloud CRM implementation variance by way of the maximum beta value was 0.44. Mainly, vendor management was found to significantly predict cloud CRM implementation ($t = 3.69$; $p = 0.00$). The result consistent with a literature review which demonstrated that vendor management could be a critical factor for cloud CRM implementation. Security was the secondly ranked variables, with a beta (b) of 0.39 and significant at 0.11, $t = 3.00$; $p < 0.05$. In order to the intellect the occurrence of multi- collinearity, the tolerance value is calculated (Table 3). Kim and Kim (2005) defined Tolerance value as a "the variability of designated independent variables not clarified by the other independent variables." Accordingly, trivial values represent high collinearity. A cutoff threshold is a tolerance value of 0.10. All variables in Table 3. have considerable higher tolerance values than 0.10. That means there is no substantial multi- collinearity.

Table 3: The results of regression analysis for cloud CRM

Variable	Standardized beta (B)	Std. error	t-value	Sig.	Tolerance value
SEC	0.39**	0.03	3.00**	0.11	0.91
VMT	0.44*	0.07	3.69*	0.00	0.86
CUST	0.25	0.11	1.81	0.23	0.89
EOU	0.29	0.14	2.55	0.09	0.87
ITSS	0.17	0.18	2.65	0.12	0.76
R ² Square	0.31				
Adjusted R ²	0.27				
F	9.31				
Std. error of the estimate	0.52				

*p < 0.01; ** p < 0.05

4. Cloud CRM: State of the art and main challenges

It can be seen in Table 4. that the supreme challenges of implementing cloud CRM at Medina hotel sector were vendor management, security, and privacy, lack of top management support to cloud CRM, availability, and reliability. Additionally, more challenges including transition and execution, IT staff skills, cultural resistance, and limited scope for customization.

Table 4: The challenges of cloud CRM

Cloud CRM challenges	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)	Mean
Vendor management	0.0	7.0	12.8	40.0	37.2	4.0
Lack of senior management awareness to cloud technology	4.2	6.7	14.2	30.0	31.7	3.2
Transition and execution	2.3	5.4	18.1	24.9	22.7	3.3
IT staff skills	14.5	8.2	18.2	28.7	26.5	3.6
Cultural resistance	7.9	15.0	15.9	29.1	31.4	3.5
Limited scope for customization	17.2	15.0	26.1	28.4	22.7	3.8
Security and privacy	2.1	5.4	21.6	36.9	35.1	3.7
Availability and reliability	21.7	20.9	27.2	17.8	1.7	2.4

5. Conclusions, implications, and future research

Zero percent (0%) of hotels invested in cloud CRM and 60% have CRM systems. 80% of the purposive sample hotels utilize CRM system in wide-ranging customers' accomplishments, whereas 10% of the purposive sample hotels use CRM in the public relations department. Zero percent (0%) of the hotels had separate CRM departments. More CRM perception, it was resolute that 80% of purposive sample hotels were customer focused, 10% were service focused, and 10% were enterprise focused. Many advantages can be achieved by applying cloud CRM especially to those adopting it including flexibility, scalability, on-demand, low entry cost, and pay-per-use models. The major factors influencing on cloud CRM implementation at five stars hotels at Almadina Almunawarah were security, vendor management, customization, ease of use, and IT staff skills. These hotels generally have inadequate investment in CRM systems and cloud computing consequently they are concerned about customers' acquisition, retention, and extension phases. Besides, it is a fact that for these hotels, a lack of enterprises provided cloud computing and convictions of top management about cloud security have a very important role in implementing cloud CRM. The outcomes of the variables according to correlation techniques revealed that was a substantial correlation among cloud CRM and the five variables (security, vendor management, customization, ease of use, and IT staff skills). It was seen the regression results of vendor management and security had the highest impact on applying cloud CRM in the five stars hotels. The conclusions of study founded the most important challenges faced those hotels were. As a result, lack of senior management cognizance to cloud technology, availability and reliability, transition and execution, and the cultural role must be considered to deploy cloud CRM successfully. Top management support, vendor locking, hotels size, data centers location, and alliances pressures can be discussed further in the future.

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