CRM E-GOVERNMENT SERVICES IN THE CLOUD

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Abstract

Customer relationship management (CRM) is a business strategy whose outcomes optimize profitability, revenue and customer satisfaction by fostering customer satisfying behaviors and implementing customer-centric processes. CRM is often seen as a key element in delivering customer-centric services. Today CRM solutions are often implemented as a cloud computing service. Cloud computing refers to providing and using computational resources via the Internet. It enables the access to technology in the form of service on demand. Services and data coexist in shared and dynamically scaled set of resources.

E-government is the organic combination of information technology and government management function. With the development of information technology, government has been upgrading from management-oriented mode to service-oriented one. Therefore, government CRM is a business strategy to provide comprehensive service from all public organizations. This paper presents a model of CRM in e-government system. Model includes process specification, metrics for evaluation of the system performance and recommendations for implementation.

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Introduction

Customer Relationship Management (CRM) today is very important for institution that aims to manage the relationship between citizens and administrators. Government institutions need to identify the problems of citizens and enhance the cohesion in relationships with citizens. A good customer relationship is the key to success. The use of customer relationship management systems in government is becoming significantly important for increasing citizen life time value. CRM e-government system is the systematic care of a business relationship between the institution and citizens. A new vision of government system in which the citizens is the central subject opens up new opportunities that include customization and adaptation to citizens' needs and preferences.

Given the possibility of dissemination of information to many users, social computing can play important role in improving the e-government process. Many social networks formed groups for government purposes. This paper discusses possible solutions for improving relations between citizens and government institutions in the process of e-government through social media. The paper focuses on the development of social media metrics that can be applied in e-government. The metrics should be defined with respect to processes in e-government, on strategic and operative levels, and synchronized with the strategy of government institutions. In this paper, we deal with metrics considering the quality of government process and outcomes, while metrics for financial outcomes are not considered.

Literature review

Customer Relationship Management
Customer relationship management (CRM) has been defined as the management approach that involves identifying, attracting, developing and maintaining successful customer relationships over time in order to increase the retention of profitable customers. CRM is a coherent and complete set of processes and technologies for managing relationships with current and potential customers and associates of the company, using the marketing, sales and service departments, regardless of the channel of communication (Chen & Popovich, 2003). CRM is a highly fragmented environment and has different meanings for different people (Sohrabi, Haghighi & Khanlari, 2010). CRM is endorsed to generate and administer bonds with clients more efficiently through the itemized and precise analysis of customer information utilizing distinctive information technologies (Peppers & Rogers, 2011). To assess future customer behavior and offer the best possible care, it is necessary to exploit,

evaluate and regularly update the company's knowledge about the customer (Wilde, 2011). CRM is therefore understood as a customer-oriented management approach where information systems provide information to support operational, analytical and collaborative CRM processes and thus contribute to customer profitability and retention (King & Burgess, 2008).

Total customer relationship management (TCRM) is proposed hopefully to validate activities more effectively, to pursue business excellence in CRM practice, as well as to have CRM become a mission covering all members, resources, processes and endeavours of an organisation. The TCRM system is composed of five components: customer-related processes, management responsibility, resource management, product or service realization and measurement, analysis and improvement (Su, Tsai & Hsu, 2010).

Social Customer Relationship Management

Social CRM is a philosophy and a business strategy, supported by a system and a technology, designed to engage the customer in a collaborative interaction that provides mutually beneficial value in a trusted and transparent business environment. It's the company's response to the customer's ownership of the conversation. Social CRM can provide the tools and strategies for meaningful, accurate customer insight. Rather than attempting to learn something emotional from a customer record, it can change the face and nature of what information is gathered, what companies can learn from that information and how they can apply that information. The information includes the nature of conversations about the company by an individual customer, customers associated with an account, or discussions going on in the general population about a company (Greenberg, 2010a). Social CRM is based on the ability of a company to meet the personal agendas of their customers while at the same time meeting the objectives of their own business plan. It's aimed at customer engagement rather than customer management (Garcia-Crespo, Colomo-Palacios, Gomez-Berbis & Ruiz-Mezcua, 2010).

The characteristics of Social CRM are (Greenberg, 2010b):
- fully integrated into an enterprise value chain and that includes the citizens as part of it,
- citizens interactions are encouraged through authenticity and transparency,
- knowledge is utilized in context to create meaningful conversations,
- the company processes are modeled from the citizens point of view,

- both information-seeking and information-contributing behaviour are encompassed into the citizens business ecosystem,

- resides in a citizens ecosystem,

- creating conversation with citizen - engaging citizen in activity and discussion – observing and redirecting conversations among citizens are activities done in the marketing frontline,

- business is an aggregator of experiences, products, services, tools and knowledge for the citizen,

- the intellectual property that is created with the citizen, partner, supplier, problem solver is also owned together,

- the business is focused on environments and experiences that engage the citizen,

- focus of technology is on both, operational and social/collaborative areas and citizen is integrated into the value chain.

Social CRM strategies often involve an integration of new tools with traditional measures. In social-communicative context social networking means the initiation of connection, mostly between strangers. In addition to being cultural, media and social contexts, social networks are aimed at interaction as one of the most important communication practices. Social network typically deals with measuring and quantifying the relationships between individuals in a group. The focus is on measuring the structural patterns of interaction and how these patterns can explain outcomes.

Social media are two-way media, and in most cases the interactions and dialogues on social media sites have been initiated and are largely conducted by private individuals, not by company representatives or officials. Social media can serve as a resource for understanding what citizens expressions about the government are (Peppers & Rogers, 2011). The social media can be defined as a type of web page through which the connection of modern Internet technology and interaction is easily enabled (DeAndrea, Ellison, LaRose, Steinfield & Fiore, 2012). Further, social media adds a level of qualitative information to the quantitative data traditionally made available through web analytics. The most popular social media applications/services are blogs, wikis, social network sites, and micro blogging (Stuart, 2009).

In terms of social media metrics, blogs have the big advantage of allowing the use of traditional web analytics. Wiki software can be used for the collaborative creation of web

pages. The success of a wiki may be quantitatively measured in several different ways: number of pages created, number of editors and the amount of edits. Social network site metrics are heavily dependent on the information that a site shares. This can vary considerably not only from site to site but also according to a user's type of account (Stuart, 2009). Social network sites have been defined by (Boyd & Ellison, 2007) as web services that allow individuals to construct public or semi-public profiles, articulate a list of other users with whom they are connected, and view and traverse connections made by others. They are usually based on the Internet or mobile technologies. Professional title for social web services is the Social Network Service (SNS). SNS allow the citizens to create and maintain personal or business contacts through a network with close friends or business partners (Radovanović, 2010). SNS represent one of the most popular forms of online communication. They enable the exchange and review of large amounts of multimedia content, finding persons of the same interests, exchange of knowledge and experiences. SNS are primarily focused on creating a community of the like-minded or on connecting a particular group of people primarily through the Internet.

E-government

Digital government, electronic government or e-government defines as the use of information and communication technologies in public administrations, combined with organizational change and new skills, to improve public services and democratic processes and to strengthen support to public policies (Kubicek, Cimander & Scholl, 2011).

E-Government is the transformation of public sector internal and external relationships through net-enabled operations, information technology and communications, to optimize government service delivery, constituency participation and governance. It can be broadly defined as a government's use of ICT, particularly Web-based Internet applications, to enhance the access to and the delivery of government information and service to stakeholders such as citizens, business partners, public sector employees, and other governments, agencies and entities. It can change the relationship between governments and the various stakeholders mentioned above from hierarchical command-andcontrol to interactive collaboration (Shan, Wang, Wang, Hao & Hua, 2011).

Public services are services delivered by government agencies to the public sectors such as education, healthcare, transportation, broadcasting, waste management and social welfare.
In e-government, public services and the respective communication can be grouped in (Kubicek, Cimander & Scholl, 2011):

- Government to Citizens (G2C) - tax declarations, applications for social benefits, requests for birth certificates or driver's licenses;

- Government to Business (G2B) - social contributions for employees, declarations of corporate tax, and different kinds of permits for export, environmental emissions;

- Government to Government (G2G) - access to central registries by local authorities, sharing of information resources.

- Government to Employees (G2E) - interpersonal communication between employees, flow of information, e-education in administration and public services, knowledge management.

E-government is much more than merely providing online services and it also involves integrating public agencies and providers, 24/7 service delivery, assimilation of new laws and government regulations. Thus, technological change must be accompanied by organizational change, process redesign, information technology governance implementation and human capital training (Concha, Astudillo, Porrua & Pimenta, 2012).

E-Government provides a platform for multi-channel interaction and multi-service delivery options. It can have an influence on cultural and social adaptation issues, transborder data flow issues, and it can raise the potential for the development of a policy to reduce the global digital divide. The construction and management of e-Government systems are becoming an essential element of modern public administration (Shan, Wang, Wang, Hao & Hua, 2011).

The evolution of e-government is often modeled by sequential steps, in the stages of growth models. Five progressive stages are (Concha, Astudillo, Porrua & Pimenta, 2012):
- Emerging - the government's online presence is established;

- Enhanced - government sites increase in number and complexity, and the information becomes more dynamic;

- Interactive - users can download forms, e-mail officials and interact through the Web;

- Transactional - users can pay for services and transactions online;

- Networked - full integration of electronic services across public agencies.

Other related proposals are the model of Layne and Lee which identifies four stages of growth focused on functionality and technical capability: (1)cataloguing, (2)transaction,

(3)vertical integration, and (4)horizontal integration (Concha, Astudillo, Porrua & Pimenta, 2012).

Social CRM in e-government

Government institutions are becoming aware that citizens' demands and desires have to be met. The CRM integration into e-government is a long and demanding process because citizens' demands are increasing simultaneously with the growth of technology capability. Citizens relationship management is the systematic care of a business relationship between the institutions and citizens, where service quality is becoming an ever more interesting question. Citizen satisfaction can be increased in this way.

The steps in the CRM implementation in e-government field are defining the CRM goal and strategies, adaptation and implementation. From the perspective of the citizen, the CRM strategy allows interaction with the government institutions from a single entity that has a complete understanding of their unique status. From the perspective of the government institutions, the CRM business strategy provides a clear and complete picture of each individual and all the activities pertaining to the individual.

Data related to citizens characteristics and interaction are substantial for CRM. Data should be acquired, stored, analyzed, distributed and applied throughout the government institution in a timely manner. Data source are documents, news, database, practice and virtual communities. Government institutions should consider what data about citizens are required to support analytics and operational processes. CRM technologies form a fundamental part of any government institution's application portfolio and architecture. CRM application requirements should be considered as the provision of integrated functionality that supports seamless citizen-centric processes across all areas of the government.

Performance measurement is one of the key aspects of managing the CRM system. It's very hard to effectively manage CRM system, if government institutions don't have insight in functionality of the system.

Well defined CRM system metrics increases chances for success through synchronization of processes in an government institution. This affects on increase of quality of the government

process. The absence of appropriate CRM metrics has bad influence on citizens' results, communication and satisfaction of their demands.

Techniques of performance measurement and system metrics that are described in the literature, put focus on key performance indicators. Some of the authors indicate need of measuring global performances, but they don't offer framework or methods for designing metrics. Additional research is necessary for identification of CRM metrics and overcoming barriers of implementation. Bigger part of literature focuses on analysis and classification of system for performance management, and smaller part to CRM metrics.

CRM must be observed as one entity and system for performance measurement must have global character. Goal is development of system metrics that enables identification of fields for improvement CRM system performance. In this way, government institution can focus their efforts and achieve better performance.

With considering all specificity of CRM system, system metrics should satisfy following criteria:

- metrics is based on processes,

- metrics is defined on all levels (strategic, operative),

- metrics is synchronized with the strategy of government institutions,

- metrics cover all relevant processes.

Standard definitions, quality description, formulas for calculation and relations between metrics on different levels, provide standard and consistent measurement of CRM system performance measurement on global level, internal and collaborative processes. Important element of system metrics are descriptions and instructions for collecting data necessary for defining (calculating metrics).

Implementation of model for Social CRM in e-government

The structural framework and the necessary elements for implementing e-government are shown in the Figure 1.
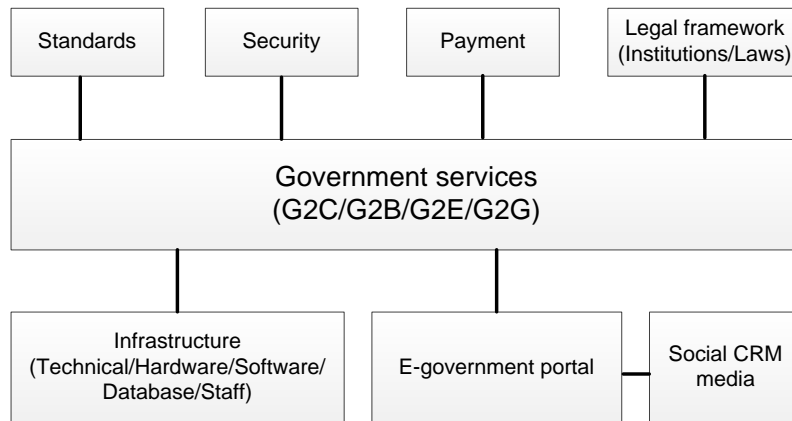
Figure 1: Structural framework of e-government

The building blocks for successful CRM projects contains (Thompson, 2011):

- SRM vision and strategy,

- valued student experience and collaboration,

- SRM processes,

- SRM metrics,

- SRM technology,

- SRM information.

The framework can be used for government and debate in developing the CRM vision and CRM strategies.

The government institution must take proactive approach in creating a citizen relationship management. The CRM vision should be used as the guide to the creation of a CRM strategy which is all about how to build and develop a valuable asset: the citizen base. It must set objectives and metrics for attaining that goal. It directs the objectives of other operational strategies and the CRM implementation strategy.

The citizen experience must be designed in line with the CRM vision and must be constantly refined, based on actively sought citizen feedback. The relationship with the citizens needs to be viewed and managed in terms of the citizen life cycle and formalized processes must exist to manage that life cycle. Collecting data is important for good relationship and adjustment government system to the needs of each citizen, and personalization of government services.

Successful e-government process should create processes that not only meet citizens' expectations and support the citizen value proposal, but also provide competitive differentiation and contribute to a designed citizen experience. In order to define an adequate set of metrics, we need to identify key processes within the e-government system.

In this paper we consider the government processes for citizens at Republic of Serbia. CRM activities are proposing to implement through SugarCRM. This software solution provides variety of features that enables implementation of CRM activities in e-government, such as: collaboration and communication among citizens and department, providing citizens with appropriate information about services, government portal promotions, citizens' roles and management, citizens' activities analytics. We identified the following processes are of importance for this research:

- promotion of e-government portal,

- usage of e-government portal,

- social CRM in government,

- issuance of documents.

In Table 1 are shown metrics for each relevant process.

Process	Attribute of performance	Definition	SRM Metrics
Promotion of e-government portal	The number of social media interactions	Conversation means the number of blog posts, forum discussions, tweets on the social network site. Volume is a strong metric when measured over time.	**Conversation volume**
	The details of online citizens	Social listening tools can collect data on citizen location, gender, and age.	**Demographic metrics**
	The number of total impressions in an online and offline discussion	Measured by the number of different sources covering a topic and each source's potential official site views.	**Message reach**
	The number of citizens' discussions around government institution	Frequency and qualitative analyses related to discussions about an government institution business.	**Frequency**
Usage of e-government portal	The attitudes of citizens	Non-adequate analysis of the citizens' needs and neglecting comments and suggestions that can be made by government institutions result in dissatisfaction and a large negative impact on the citizens	**Sentiment Type**
	Financial position	Government institution provides financial benefits for some citizens.	**Citizen equity**
	The number of company partners	The number of enterprises that have signed contracts with government.	**Work**
	Distance and speed at which a information spreads	Measured by number of different entries around the same topic within a certain time period.	**Viral Propagation**
Social	The number of access to portal	Automatically collected data from web server logs. These are rich collections of data relating	**The intensity of the use of portal**

CRM in government		the access to specific web pages.	
	The number of posts on forum	Interactivity between citizens and government in the online portal is measured through the amount of comments, which clearly shows the interest of both sides for good communication and obtaining the necessary information.	**The intensity of the interaction trough portal**
	The number of group members	Interactivity between citizens and government in social networks is measured trough the number of posts. Significant indicator of citizens' interest for the web site of the Republic of Serbia is the same number as view the same.	**The intensity of the interaction on social networks**
	Processing time	Time metrics evaluate the time to deliver a product or service to customers, the portion of time that is spent processing the documents or idle time, whether citizens receive documents or responses on time, and other time-related considerations.	**Total time**
	The number of steps in the process	Number of times is a document handed off between individuals, offices, or departments in the process.	**Process complexity**
	Process cost	How much does the process cost to operate online.	**Cost**
Issuance of documents	The number of citizen referrals	The number of citizens who have previously finished work with the government institution.	**Good reputation of government process**
	Satisfaction with the work of institution	Availability of staff in government for consultation and help, as well as recommendations for practice and work.	**Expertise and availability of government**
	The number of open opportunities	Percentage of citizens who were employed in the profession.	**Employed citizens**

Table 1: E-government social CRM metrics

Public services for citizens	**Metrics**
1. Income taxes	Declaration, notification of assessment
2. Job search	The number of citizens registered in the employment office
3. Social security contributions	Unemployment benefits, family allowances, medical costs, student stipends
4. Personal documents	The number of passport, driver's license
5. Car registration	The number of license plate
6. Application for building permission	The number of steps in a process where a task or activity is performed
7. Declaration to the police	The number of legal offenses
8. Public libraries	The number of available catalogues, books, search tools
9. Certificates, request and delivery	The number of birth, marriage
10. Enrolment in higher education	The number of new students
11. Change of address	The number of requests for the purchase and sale of homes or apartments
12. Health related services	The number of appointments for hospitals

Table 2: Public services and metrics for citizens

CRM module for passport issuing (Figure 2), as part of proposed e-government portal provides possibility for registration by citizens and sending notifications when requirement is fulfilled. By using this module government can send notifications to citizens via e-mail when application form is accepted. Integration between the government portal and mail server enables sending automatic and personalized information about citizens' activities. Figure 3 show schedule of appointments for passport issuing.

Figure 2: Application for passport issuing

Figure 3: Schedule of appointments for passport issuing

Conclusion

This paper provides a description of social media metrics and the possibilities of their use in the of e-government. The concept of CRM is for government institutions a tool for more effective management of communication. The government institutions that use the CRM are able to automate activities such as generating and sending e-mails, responding to citizens requests for a particular type of information, etc. The system based on maintaining relationships with citizens represents the imperatives of competitiveness.

Customer/citizen interactions, conversations, and relationships are what transform CRM into social CRM. CRM metrics not only gauge the level of success, but also provide the feedback

mechanism for continuous development of strategy and tactics. CRM metrics must follow and measure the enterprise's own CRM strategy. A hierarchy of metrics is required, depending on their purpose and who is using them.

The future research directions include the improving of social media model, more detailed consideration of the indicators in the field of e-government and highlighting the significance of social media in all areas of e-government and government institutions.

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References

[1] Boyd, Danah M. & Ellison, Nicole B. (2007): Social network sites: Definition, history, and scholarship. Journal of Computer-Mediated Communication. Vol.: 13, No.: 1, pp.: 210-230.

[2] Chen, Injazz J. & Popovich, Karen. (2003). Understanding customer relationship management (CRM): People, process and technology. Business Process Management Journal. Vol.: 9, No.: 5, pp.: 672-688.

[3] Concha, Gaston, Astudillo, Hernan, Porrua, Miguel & Pimenta, Carlos (2012): E-Government procurement observatory, maturity model and early measurements. Government Information Quarterly. Vol.: 29, No.: 1, Supplement: S, pp.: S43-S50.

[4] DeAndrea, David C, Ellison, Nicole B, LaRose, Robert, Steinfield, Charles & Fiore, Andrew (2012): Serious social media: On the use of social media for improving students' adjustment to college. The Internet and Higher Education. Vol.: 15, No.: 1, pp.: 15-23.

[5] Garcia-Crespo, Angel, Colomo-Palacios, Ricardo, Gomez-Berbis, Juan Miguel & Ruiz-Mezcua, Belen (2010): SEMO: A framework for customer social networks analysis based on semantics. Journal of Information Technology. Vol.: 25, No.: 2, pp.: 178-188.

[6] Greenberg Paul (2010a): The impact of CRM 2.0 on customer insight. Journal of Business and Industrial Marketing. Vol.: 25, No.: 6, pp.: 410-419.

[7] Greenberg, Paul (2010b): CRM at the Speed of Light, Fourth Edition: Social CRM Strategies, Tools, and Techniques for Engaging Your Customers. McGraw-Hill Companies, Inc.

[8] King, Stephen F. & Burgess, Thomas F. (2008): Understanding Success and Failure in Customer Relationship Management. Industrial Marketing Management. Vol.: 37, No.: 4, pp.: 421-431.

[9] Kubicek, Herbert, Cimander, Ralf & Scholl, Hans Jochen (2011): Organizational Interoperability in E-Government, Lessons from 77 European Good-Practice Cases. Berlin Heidelberg: Springer-Verlag.

[10] Peppers, Don & Rogers, Martha (2011): Managing Customer Relationships: A Strategic Framework (Second Edition). Hoboken, New Jersey: John Wiley & Sons, Inc.

[11] Radovanović, Danica (2010): Internet paradigma, struktura i dinamika onlajn društvenih mreža: Fejsbuk i mladi u Srbiji. In International Interdisciplinary conference "Problems of Adolescence", University of Oxford (UK), 26. June 2010. (20-26). Serbia: Pančevačko čitalište.

[12] Shan, Siqing, Wang, Li, Wang, Jing, Hao, Yi & Hua, Fan (2011): Research on e-Government evaluation model based on the principal component analysis. Information technology & management. Vol.: 12, No.: 2, pp.: 173-185.

[13] Sohrabi, Babak, Haghighi, Mohammad & Khanlari, Amir (2010): Customer relationship management maturity model (CRM3): A model for stepwise implementation. International Journal of Human Sciences. Vol.: 7, No.: (1), pp.: 1-20.

[14] Stuart, David (2009): Social media metrics. Online. Vol.: 33, No.: 6, pp.: 22-24.

[15] Su, Chun-Hsien, Tsai, August & Hsu, Chu-Ling (2010): The TQM extension: Total customer relationship management. Total Quality Management. Vol.: 21, No.: 1, pp.: 79-92.

[16] Thompson, Ed (2011): Gartner's View: CRM. Gartner.

[17] Wilde, Silvio (2011): Customer Knowledge Management: Improving Customer Relationship Through Knowledge Application. Berlin Heidelberg: Springer.