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Social Media Adoption for Social CRM in Higher Education: an Insight from Indonesian Universities

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Abstract
A high usage of social media and web 2.0 in Indonesia creates an opportunity for Indonesian universities to understand their customers' demands and needs. By considering social media and web 2.0 technology as an important role for the application of social customer relationship management (social CRM), this research is intended to evaluate the adoption and application level of social media and web 2.0 by universities in Indonesia. We accomplish an observation towards websites and web 2.0 and social media features, which are used by 58 universities in Jakarta, to be analyzed using non-exhaustive Sophistication Index. In addition, we execute a survey as well to take a look on university principals' perception towards the practice of web 2.0 and social media application, and analyze it with Importance Performance Analysis (IPA). The result of this research shows that there are some web 2.0 and social media features which need to be utilized more frequently by universities, though most of these features have been working optimally.

Keywords – Social Media, Web 2.0, Social CRM, Non-exhaustive Sophistication Index (SI), Shannon entropy, Importance-Performance Analysis (IPA), Education, Synergy, Research.

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1. Introduction

Web/Internet technology has been improving rapidly nowadays. Initially, web technology was only designed to display static and unattractive contents, known as web 1.0. However, technology improvement leads to the technology itself to evolve into web 2.0, which enables global and massive information sharing, collaboration, participation and distribution functions (Patel, 2013). This web 2.0 technology later on drives the occurence of social media, which is a a second generation web based on the use of novel technologies, such as RSS (Really Simple Syndication of web contents), podcasting (syndication of audio content), mashups (combination of pre-existing applications), folksonomies (popular labeling or categorizing), widgets (web tools embedded in other sites to perform a particular function) and sharing facilities (options for redistributing the contents of websites to other users) (O'Really as cited in Bonson et al., 2012). A few social media examples are: blogs, social bookmarking, wikis, media sharing as well as social networks that promote collaboration, joint learning and the speedy exchange of information between users (Bonson et al., 2012).

The web 2.0 and social media technology innovation unexceptionally alters the way organizations manage their customers, or what is commonly known as Customer Relationship Management (CRM). The first generation of CRM (known as CRM 1.0) is initally used to manage customer information and utilize it for decision-making in business (Mohan, Choi, and Min, 2008; Greenberg, 2010). The main characteristic of CRM 1.0 is one-way attribute, where organization acts as the ecosystem center, thus the focus is only on internal operational approach to manage customer relationship effectively (customer management). On the second generation of CRM (known as CRM 2.0 or social CRM), the CRM concept shifts by putting customers as priority. Customers are no longer seen as only information consumers, but customers are able to get involved in the product manufacturing process. It is possible because the appearance of social media has changed customers' behaviour in using web, where they have the chance to give complaints on organization's product/service or give positive inputs by collaborating with the organization to create product/service desired by customers (customer engagement) (Greenberg, 2010).

With all advantages offered by social media technology, a lot of organizations have started to exploit social media on various occasions, including customer management. A research by Greenberg (2010) shows how social CRM has contributed positive benefits, especially in creating business value directly by customers, not merely as the central repository for value. For service area like higher education, social CRM should be capitalized particularly to attract prospective student to choose a specific university.

Indonesia is the third largest social media owner in Asia Pacific after China and India (Statistica, 2015), providing an opportunity for universities to make use of web 2.0 and social media. Even though web 2.0 and social media have been proven giving marvelous benefits, a lot of universities are still not exploiting them (Davis III et al., 2012; Reuben, 2008).

By considering the issue, this research is intended to take a look on web 2.0 and social media adoption for social CRM on Indonesian universities. There are two problem focuses in this research: (1) How far is web 2.0 and social media adoption for Social CRM on Indonesian universities? (2) What is the importance level perception of the web 2.0 and social media application for Social CRM on Indonesian universities?

By accomplishing this research, the adoption of web 2.0 and social media on Social CRM in Indonesian universities can be revealed, and the compatibility between importance level and implementation level of social media on Social CRM can be recognized to be the improvement basis.

2. Literature Review

2.1. Web 2.0 and Social Media

The term Web 2.0 was coined by O'Really (2005) to refer to a second generation web based on the use of novel technologies, such as RSS (Really Simple Syndication, of web contents), podcasting (syndication of audio content), mashups (combination of pre-existing applications), folksonomies (popular labeling or categorizing), widgets (web tools embedded in other sites to perform a particular function) and sharing facilities (options for redistributing the contents of websites to other users).

Web 2.0 definition covers various understandings including the emphasis on user-generated content, willingness to share data and content, effort to collaborate, new way to interact using web-based application, web usage as *social platform* to produce, reposition and content usage (Harris and Rea, 2009).

Web 2.0 technologies or what almost universally has been called social media (Burns, 2008) makes the term web 2.0 and social media interchangeable. Social media are various online technology tools which enable people to easily communicate through Internet and share information and resources. Social media can be in the form of text, audio, video, image, podcast and other multimedia communication (Doyle, 2012). The other definition of social media is a group of Internet-based applications which build ideology and Web 2.0 technology foundation, and permit the creation and exchange of User Generated Content (UGC). There are several types of social media like Wikipedia, YouTube, Facebook and Second Life (Kaplan and Haenlein, 2010).

The forms of social media according Patoine (2012) are:

- Blog: user-generated content publication, such as Blogger or WordPress,
- Forum/review sites: peer-to-peer community based on discussion, for instance, Tripadvisor, MoneySupermarket,
- Microblog: brief post (message, photo, link, etc.), like Twitter, Tumblr,
- Social Network: platform which connects people with mutual interest, for example, Facebook, GooglePlus+ or LinkedIn,
- Sharing: platform to share videos, images and other contents, like YouTube, Flickr,
- Other channels: wiki, gaming, podcast, lifecasting, social couponing, such as Wikipedia or Groupon

With the beginning of 2002, came an explosion of social network sites on the web such as Friendster, Facebook, YouTube, Twitter and hundreds of others. Social network sites are web-based services that allow individuals to: (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system (Boyd and Ellison, 2007; Castells, 2013).

On the Internet, organization must consider the strategic implications of the existence of different types of both virtual community and community participation. Strategies for effectively targeting more desirable types of virtual communities and types of community members include: interaction-based segmentation, fragmentation-based segmentation, co-opting communities, paying-for-attention, and building networks by giving product away (Kozinets, 1999).

One of the analysis methods which are used to discern web 2.0 and social media adoption in a website is non-exhaustive Sophistication Index. Non-exhaustive Sophistication Index detects web 2.0 and social media presence, usage and effectivity factors in thirteen variables: (1) podcasts from the management, (2) RSS or ATOM, (3) vodcasts from the management, (4) realtime webcast events, (5) widgets, (6) blogs, (7) links to official YouTube video from the website, (8) social network for the users of the university website, (9) official Twitter account, (10) official Facebook group, (11) official Facebook page, (12) official LinkedIn group and (13) official YouTube channel (Bonson et al., 2012).

2.2. Social CRM

Social CRM is a philosophy and a business strategy supported by a technology platform, business rules, processes and social characteristics designed to engage the customer in a collaborative conversation in order to provide mutually beneficial value in a trusted and transparent business environment. It is the company's response to the customer's ownership of the conversation (Greenberg, 2010). Social CRM is commonly known as CRM 2.0 because it is based on Web 2.0 (Askool and Nakata, 2010). The feature and function of Social CRM technology are based on the emotional and behavioral characteristics of human interactions, which are often called social characteristics. Social characteristics are based on the profiles of individuals who are participating in web-based interactions among peers and, for our purposes, between customer and companies (Greenberg, 2010).

Thomas Vander Wal, the creator of social tagging and folsonomies in Greenberg (2010) has developed an approach to the way that human profiles on the web are affected by their actions on each other and the implications of that for business and for web activity. He calls it the social stack. The core components of the social stack are "identify" and "objects". Identify is just what it seems to be – who you are and how you present yourself. The simplest form is your personal profile. Objects are those things that you use to enhance your identity – photos, videos, comments, social tags, ratings and bookmarks. They are often called user-generated content (UGC). While there are two core components, each of them is affected by a separate group of characteristics that affect the way they interact. These are: presence, actions, sharing, reputation, relationships, conversation, groups, collaboration and context (Greenberg, 2010). Social media enables customers to take a more active role as market players and reach (and be reached by) almost everyone anywhere and anytime (Hennig-Thurau et al., 2010)

2.3. Shannon Entropy

Shannon (1948) explains that entropy methods can be used not only to quantitatively estimate the number of data, but also to objectively calculate the relative weight of

information (Hsu and Hsu, 2006). Entropy in information theory is a criterion on uncertainty number represented by discrete probability distribution (Jaynes, 1957 in Hsu and Hsu, 2006). Several researches have utilized entropy method to weigh attributes on case studies such as: the selection of main ingredients supplier (Wardhani, Usadha and Irawan, 2012), the evaluation of water quality in *reservoir* (Zou, Yun, and Sun, 2006), the determination of critical success factors on health and work safety assurance implemented in organization (Shirouyehzad et al., 2011) and the ERP selection for organization (Asl et al., 2012).

While the weighing steps by using entropy method are as follows:

1. All decision makers provide a value which shows a specific criterion's importance towards the decision-making. Every decision made by them can score according to their own preference.
2. Subtract each number with the most ideal value. The subtraction result is defined as Xij.
3. Divide every Xij with the total value in all criteria to get Pij.

$$P_{ij} = \frac{X_{ij}}{\sum_{i=1}^{m} X_{ij}}, \quad \forall i, j.$$

Where m = number of decision makers

4. Calculate entropy score for every criterion with the following formula:

$$E_j = -k \sum_{i=1}^{m} P_{ij} \ell n P_{ij}, \quad \forall j.$$

Where $k = \frac{1}{\ell nm}$

Subsequently, count the dispersion of every criterion with the following formula:

$$d_j = 1 - E_j, \quad \forall j.$$

The total weigh is assumed as 1, thus in order to earn every criterion's weigh, the dispersion value has to be normalized first, therefore:

$$W_j = \frac{d_j}{\sum_{j=1}^{n} d_j}, \quad \forall j.$$

Where n = number of criteria

2.4. Importance Performance Analysis (IPA)

At first, Importance Performance Analysis (IPA) method was introduced by Martilla and James (1977) to measure the relationship between customer perception and product/service quality enhancement priority, known as quadrant analysis (Brandt, 2000; Latu and Everett, 2000). IPA has been publicly accepted and has been used in various study fields due to its convenience and its analysis result display, which eases the suggestion on performance improvement (Martinez, 2003). IPA has the main function to display information related to service factors, which are regarded by customers as influencing their satisfaction and loyalty and the need to be enhanced because the current condition is still not satisfying enough.

IPA combines the measurement of importance level and satisfaction level factors in a two-dimension graphic, which accomodates the explanation of data and practice suggestion. The interpretation of IPA graphic is very simple, it is divided into four quadrants based on measuring result, as seen in Figure 1.

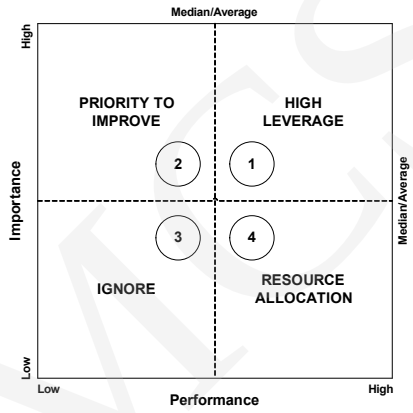

Figure 1.
Divisions of IPA Quadrants (source: Brandt, 2000)

Here is an explanation for each quadrant (Brandt, 2000):

- First Quadrant, "High Leverage" (*high importance and high performance*)
  Factors which are located in this quadrant are considered as supporting factors for customer satisfaction. Thus, the managerial party is obliged to ensure a good maintainance of its institution's performance.
- Second Quadrant, "Priority to Improve" (*high importance and low performance*)
  Factors which are located in this quadrant are considered by customers as essential factors, but the current situation is still not satisfying enough. Thus, the managerial party is obliged to allocate qualified resources to improve the performance of those various factors. Factors located in this quadrant have the priority to be enhanced.
- Third Quadrant, "Ignore" (*low importance and low performance*)
  Factors which are located in this quadrant have low satisfaction level and are considered not too important for customers. Thus, the managerial party does not need to prioritize or pay too much attention to those factors.
- Fourth Quadrant, "Resource Allocation" (*low importance and high performance*)
  Factors which are located in this quadrant are considered not too important. Thus, the managerial party needs to allocate resources related to those factors towards other more prioritized factors, for instance, in the second quadrant.

There are two types of methods to display IPA data (Martinez, 2003): first, by placing quadrant intersection line on the median of the valuation scale, which is used in satisfaction level axis and handling priority axis, in order to generally find out in which quadrant the data is spread; and second by placing quadrant intersection line on the average of satisfaction level axis and handling priority axis in order to specifically find out in which quadrant each factor is located. The procedures related to IPA method usage are as follows:

- determining which factors are going to be analyzed,
- completing survey by spreading questionnaire,
- calculating average value of satisfaction level and handling priority level,
- creating IPA graph,
- evaluating factors in every quadrants.

3. Methodology

This research is accomplished by using two approaches: observation and survey towards 58 private universities in Jakarta. Private universities are selected due to high difficulty level in recruiting new students. The selection of the 58 private universities is done by considering Webometric ranking, 4ICU ranking and recognition given by the government as top universities.

Observation is done to analyze universities' adoption level towards web 2.0 and social media by observing universities' websites and web 2.0 and social media features which are used by the universities. The observed elements are adapted from non-exhaustive sophistication index (SI), which are frequently used to analyze e-government adoption (Bonson et al., 2012) and covers 13 variables: (1) podcasts from the management, (2) RSS or ATOM, (3) vodcasts from the management, (4) realtime webcast events, (5) widgets, (6) blogs, (7) links to official YouTube video from the website, (8) social network for the users of the university website, (9) official Twitter account, (10) official Facebook group, (11) official Facebook page, (12) official LinkedIn group and (13) official YouTube channel (Bonson et al., 2012).

A survey is fulfilled to see the compatibility between importance and implementation level on universities and to provide recommendation for improvement needed in implementing Social CRM. Importance level will be analyzed based on weighing/ranking with Shannon entropy method, while compatibility level will be measured by using Importance Performance Analysis (IPA) method. The research instruments in this survey is a questionnaire, where the dimension/indicator is revealed from social stack theory (web 2.0 and social media feature) by Greenberg (2010) and can be seen in the following Table 1. The usage of web 2.0 feature on social stack does not convey completely from non-exhaustive Sophistication Index variable by Bonson et al. (2012).

4. Results and Discussions

The adoption of web 2.0 and social media on universities' websites and the analysis of social media function importances on social CRM in Indonesia will be discussed in Results and Discussions.

4.1. Web 2.0 and Social Media Adoption on Universities' Websites

According to non-exhaustive sophistication index (SI) analysis, which can be seen in the following Table 2, it is explained that most universities' websites have realtime webcast of events (98.28%). It means that only one website does not use this feature.

Variable	Sub Variable	Dimension/ Indicator	Dimension/ Indicator Description	References	Dimension/ Indicator No
Social Media			Various online technology tools which enable people to easily communicate through internet and share informations and resources. This social media can be in the form of text, audio, video, image, podcast, and other multimedia communications. Own social media accounts	Doyle, 2012 Greenberg, 2010:41	1
Social Media Social Media	Identify		Someone's profile in web is influenced by his/her action to one another, and the implication towards web business and activities	Greenberg, 2010:41	
		Identify/ Profile	What is seen -- who are you and how do you show yourself?	Greenberg, 2010:41 Mohan, Choi & Min, 2008: 239 Olivera, Sita & Sasa, 2013:347, 348, 351 Mousavi & Demirkan, 2013: 718 Heath, Singh & Ganesh, 2014:589	2
	Object		Something used to clarify self identification	Greenberg, 2010:41 Heath, Singh & Ganesh, 2014:591 Olivera, Sita & Sasa, 2013:350	
	Object Object	Photos	Self image or certain image which shows what to be shared to others	Greenberg, 2010:41 Mohan, Choi & Min, 2008: 239 Dukić, Meler & Mesarić, 2009:116 Olivera, Sita & Sasa, 2013:348	3
		Videos	Digitally-moved visual graphic record	Greenberg, 2010:41 Dukić, Meler & Mesarić, 2009:116 Olivera, Sita & Sasa, 2013:349, 351 Mousavi & Demirkan, 2013: 718, 719	4
		Comments	Word or sentence which is written to express opinion or reaction	Greenberg, 2010:41 Mohan, Choi & Min, 2008: 242 Olivera, Sita & Sasa, 2013:351 Mousavi & Demirkan, 2013: 718	5
		Social tags/ folksonomies	System which is processed by user to classify and manage online contents into different categories by using meta data, such as electronic tags	Greenberg, 2010:41 Mohan, Choi & Min, 2008: 240	6
		Ratings	Classification or ranking based on comparison score of quality, standard, or performance	Greenberg, 2010:41 Mohan, Choi & Min, 2008: 240	7
		Bookmarks	Record of website address, file, etc. to ease the access afterwards	Greenberg, 2010:41	8
		Reviews	Formal scoring or testing on something with certain intention	Greenberg, 2010:41 Heath, Singh & Ganesh, 2014:587	9
		Rankings/ Indexed	Position or classification in achievement or status scale	Greenberg, 2010:41 Mohan, Choi & Min, 2008: 240	10

Table 1.
Dimension/Indicator in Research Instrument

Variable	Sub Variable	Dimension/ Indicator	Dimension/ Indicator Description	References	Dimension/ Indicator No
		Blogs	Web-based journal, an account consisting events/thoughts/ideas which can be written individually or sometimes by a group of people. It is commonly used by companies to brand or to reach customers internally to discuss ideas/ documents in the team.	Greenberg, 2010:127 Mohan, Choi & Min, 2008: 240 Heath, Singh & Ganesh, 2014:585, 588 Olivera, Sita & Sasa, 2013:348, 351 Mousavi & Demirkan, 2013: 725	11
		Wikis	Website which allows user to edit a content together all at one time	Greenberg, 2010:127 Mohan, Choi & Min, 2008: 240 Olivera, Sita & Sasa, 2013:351	12
		Podcasts	Audio file which uses RSS (Really Simple Syndication) to distribute broadcasts to customers, or allow customers to download them into computer or portable music device	Greenberg, 2010:129	13
		Mail	Electronic mail which ease the sending and receiving process	Mohan, Choi & Min, 2008: 240 Mousavi & Demirkan, 2013: 718	14
		Forums	Media to trade idea, knowledge, and perception regarding certain thing/issue	Mohan, Choi & Min, 2008: 242 Dukić, Meler & Mesarić, 2009:116, 117 Olivera, Sita & Sasa, 2013:348, 349, 351	15
		Presence/ Instant Messaging	Allow us to know how others would like to be contacted when they are online. IM is defined as an one-on-one communication assisting tool. IM has unique features such as: real-time trading on text,file,graph, graphic icon, contact list, presence awareness, "pop up" recipient notification, and polychromic communication	Greenberg, 2010:42 Chen, 2009:518 Heath, Singh & Ganesh, 2014:587 Mousavi & Demirkan, 2013: 725	16
		Actions	Direct action, for example: uploading photo, leaving comment on video, sending message, etc	Greenberg, 2010:42 Bekmamedova & Shanks, 2014:3730, 3732, 3734, 3735 Heath, Singh & Ganesh, 2014:584-586, 588-593 Olivera, Sita & Sasa, 2013:347, 348	17
		Sharing	Single element which is considered valuable when it is shared to others, for instance: a video on how to survive from tsunami/earthquake, etc	Greenberg, 2010:42 Mohan, Choi & Min, 2008: 240 Olivera, Sita & Sasa, 2013:348 Mousavi & Demirkan, 2013: 718	18
		Reputation	Trust level towards others. Reputation can be boosted through individual participation in cooperative environment like wiki or community	Greenberg, 2010:43 Bekmamedova & Shanks, 2014:3730, 3732, 3733	19

Table 1.
Continuation

Variable	Sub Variable	Dimension/ Indicator	Dimension/ Indicator Description	References	Dimension/ Indicator No
		Relationships	Interaction among humans which choose to get involved based on its reputation. People trust result from an action	Greenberg, 2010:42 Mohan, Choi & Min, 2008: 239 Heath, Singh & Ganesh, 2014:584, 590, 592 Olivera, Sita & Sasa, 2013:347, 348, 352	20
		Conversation	Relationship between companies and customers has been shifting, where companies initially push their products to customers. Currently, it has become a conversation between companies and customers. This means customers work together with companies to create a suitable and valuable experience for customers, and companies will get profit in return	Greenberg, 2010:44 Bekmamedova & Shanks, 2014:3731 Heath, Singh & Ganesh, 2014:585, 588, 589	21
		Groups	Usually called as community with mutual interest/practice, consisting of people who interact one another on certain domain, for example: profession club	Greenberg, 2010:44 Mohan, Choi & Min, 2008: 242 Heath, Singh & Ganesh, 2014:590, 592 Olivera, Sita & Sasa, 2013:347-351 Mousavi & Demirkan, 2013: 720	22
		Communities	A group of people who has a specific mutual characteristic	Mohan, Choi & Min, 2008: 242 Heath, Singh & Ganesh, 2014:588 Olivera, Sita & Sasa, 2013:351 Mousavi & Demirkan, 2013: 720	23
		Collaboration	Relationship of one another which gives valuable benefits	Greenberg, 2010:44 Mohan, Choi & Min, 2008: 240	24
		Context	How a previously-made profile will be used to define what is intended, what is seen, and how it is seen, for instance: status is made to let other people know what we need	Greenberg, 2010:45 Bekmamedova & Shanks, 2014:3730, 3732 Heath, Singh & Ganesh, 2014:585, 588, 589, 590 Olivera, Sita & Sasa, 2013:348 Olivera, Sita & Sasa, 2013:351 Mousavi & Demirkan, 2013: 718-724	25

Table 1.
Continuation

The most adopted feature by all universities' websites is widgets (89.66%). Widgets feature significantly helps customers to access all applications in the website. However, podcast from management feature has not been implemented in any websites yet (0.00%). This issue occurs because generally websites still have text displaying message/greeting by the universities' management (rector/head/director).

(2010) has developed an approach to the way that human profiles on the web are affected by their actions on each other and the implications of that for business and for web activity. He calls it the social stack. The core components of the social stack are "identify" and "objects". Identify is just what it seems to be – who you are and how you present yourself. The simplest form is your personal profile. Objects are those things that you use to enhance your identity – photos, videos, comments, social tags, ratings and bookmarks. They are often called user-generated content (UGC). While there are two core components, each of them is affected by a separate group of characteristics that affect the way they interact. These are: presence, actions, sharing, reputation, relationships, conversation, groups, collaboration and context (Greenberg, 2010). Social media enables customers to take a more active role as market players and reach (and be reached by) almost everyone anywhere and anytime (Hennig-Thurau et al., 2010)

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2. Subtract each number with the most ideal value. The subtraction result is defined as Xij.
3. Divide every Xij with the total value in all criteria to get Pij.

$$P_{ij} = \frac{\cdot X_{ij}}{\sum_{i=1}^{m} X_{ij}}, \quad \forall i, j.$$

Table 2.
The usage of web 2.0 and social media in universities' websites

Table 2.
Continuation

No	The usage of university website	Private Higher Educations																		Total	%
		41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58		
1	Podcast from the management	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
2	RSS or Atom	1	0	0	0	1	1	0	1	1	0	0	0	0	0	0	1	0	0	20	34.48%
3	Vodcast from the management	1	0	0	1	0	1	0	0	1	1	0	0	0	1	0	1	0	0	30	51.72%
4	Realtime webcast of events	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	57	98.28%
5	Widgets	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	52	89.66%
6	Blogs	1	0	0	0	0	0	1	0	1	0	0	0	1	0	0	1	1	0	21	36.21%
7	Links to official YouTube videos	1	0	0	1	0	1	0	0	1	1	0	0	0	1	0	1	0	0	26	44.83%
8	Social network for the users of the university website	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	39	67.24%
9	Official Twitter account	1	1	1	1	1	1	1	0	1	1	0	1	0	1	1	1	1	1	41	70.69%
10	Official Facebook group	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	0	19	32.76%
11	Official Facebook page	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	58	100.00%
12	Official LinkedIn group	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	49	84.48%
13	Official Youtube channel	1	0	0	1	0	1	0	0	1	1	0	0	0	1	0	1	0	0	30	51.72%

Table 3.
Non-exhaustive Sophistication Index

				Universities (58)	
				N	%
Sophistication Index	Web 2.0	Official Website	Podcast from the management	0	0.00%
			RSS or Atom	20	34.48%
			Vodcast from the management	30	51.72%
			Realtime webcast of events	57	98.28%
			Widgets	52	89.66%
	Social Media		Blogs	21	36.21%
			Links to official YouTube videos	26	44.83%
			Social network for the users of the university website	39	67.24%
		External Channels	Official Twitter account	41	70.69%
			Official Facebook group	19	32.76%
			Official Facebook page	58	100.00%
			Official LinkedIn group	49	84.48%
			Official Youtube channel	30	51.72%

Summary data on non-exhaustive Sophistication Index can be seen in the following Table 3.

From the social media point of view, only 67.24% (39 from 58) universities publish social media link on their official websites. The common social media are Facebook, Twitter, LinkedIn and YouTube. All universities (100%) utilize Facebook fanpage (58 from 58) and only 19 universities utilize Facebook group (32.76%). The next most

commonly-used social media are LinkedIn group (84.48%) and Twitter (70.69%). YouTube channel is used as well as vodcast from management by 51.72%.

According to the observation towards universities' activities on facebook social media, there are sixteen universities which update daily information (daily activities); seven universities which update weekly activities; nine universities which update monthly activities; four universities which update quarterly activities; eight universities which update annual activities; and fifteen universities which do not have any update at all on their Facebook (no activity).

Meanwhile in the Twitter social media observation towards forty-one universities which have a Twitter account, there are eleven universities which update (tweet) daily information (daily activities); eight universities which update weekly activities; four that update monthly activities; six universities which update quarterly activities; one university which updates semestral activities; one university which updates annual activities; and ten universities which do not have any update (tweet) at all in their Twitter accounts (no activity). The detailed social media usage can be seen in the following Table 4.

Table 4 shows that social media has been started to be utilized. The number of followers in Twitter reach 8,318 on average and the number of fans in Facebook page reach 10,004 on average. Moreover, Twitter and Facebook activity are the most frequently operated social media (daily-based).

	Social Media Metrics	Mean/Amount
twitter	Universities with an official Twitter account	41 (70.69%)
	Average number of Twitter followers	8 318
	Average number of Twitter tweets	2 378
	Average number of Twitter lists	0.44
	Activity of the official Twitter account	7
facebook	Average number of Facebook groups	1
	Universities with an official Facebook group	19 (31.76%)
	Average number of members of the official Facebook group	663
	Average number of Facebook pages	2
	Universities with an official Facebook page	58 (100%)
	Average number of fans of the official Facebook page	10 004
	Activity of the official Facebook page	7
LinkedIn	Average number of LinkedIn groups	1
	Universities with an official LinkedIn group	49 (84.48%)
	Average number of members of the official LinkedIn group	2569
YouTube	Universities with an official YouTube channel	30 (51.72%)
	Average number of subscribers to the official YouTube channel	14
	Average number of YouTube conversations	7054

Table 4.
Social media usage on universities (social media metrics)

4.2. Analysis of Social Media Function Usage-Importance on Social CRM

Among fifty-eight private universities in Indonesia which have been sent questionnaire, seventeen of them returned the questionnaire. Survey is accomplished to see the compatibility between importance and application level on universities and to give recommendation for improvement needed in implementing Social CRM.

Importance level is analyzed based on weighing/ranking with Shannon Entropy method to observe which factor is considered the most fundamental by respondents in implementing social media on universities. The result of Shannon Entropy calculation can be seen in the following Table 5.

According to the Table 5 above, it is clearly seen that respondent universities consider owning social media account essential as well as publishing universities' identity, official photos and official video (4th highest rank). It does make sense because social media's

Table 5.
Result of Shannon Entropy calculation for weighting/ranking

Questionnaire No	Entropy Value	Dimention/Indicator
1	0.041874	Social media account
2	0.041874	Institution identity
3	0.041656	Official photos
4	0.041176	Official videos
20	0.040495	Relationship
8	0.040423	Bookmarks
19	0.040378	Reputation
25	0.04035	Context
5	0.040305	Comments
15	0.040278	Forum
16	0.04016	Presence/instant mesaging
21	0.040088	Conversation
18	0.039915	Sharing
11	0.039876	Blogs
9	0.039849	Review
7	0.039625	Rating
24	0.03958	Collaboration
6	0.039408	Social tags/folksonomies
23	0.039407	Communities
10	0.039396	Ranking/indexing
14	0.039262	Email
22	0.039189	Groups
13	0.039044	Podcasts
12	0.038664	Wikis
17	0.037726	Actions

basic contents are the account owner's name, photos and video. The next 5th–10th rank in correct order are: relationship, bookmarks, reputation, context, comments and forum. Respondents see that the main goal of using social media is to maintain relationship. Contents classification (bookmarks) inside is very helpful for the account owner to look for or find the desired content. The foundation of relationship in social media is based on trust grown by the account owner's reputation. This reputation is formed based on context such as: status made by the account's owner, shared information and especially comments given to both him/herself or others. Forum establishment is often done to assist the communication among parties with a mutual importance, interest, hobby or similarity and to provide open communication to help finding information.

Compatibility level is measured using importance-performance analysis (IPA) method. IPA method uses 2 approaches which produce similar result. The first IPA method needs every dimension/indicator to be mapped into the intersection quadrant of importance and implementation axis using the median and the mean, as can be seen in the following Table 6 and Figure 2.

No	Performance (X)	Inportance (Y)	Gap (X-Y)	Median Quadrant	Mean Quadrant
1	5.294117647	5.823529412	-0.529411765	1	1
2	5.647058824	5.823529412	-0.176470588	1	1
3	5.647058824	5.823529412	-0.176470588	1	1
4	5.117647059	5.647058824	-0.529411765	1	1
5	5.117647059	5.470588235	-0.352941176	1	1
6	3.470588235	5.176470588	-1.705882353	2	3
7	3.764705882	5.235294118	-1.470588235	1	3
8	4.352941176	5.352941176	-1	1	1
9	3.882352941	5.117647059	-1.235294118	1	3
10	3.529411765	4.941176471	-1.411764706	1	3
11	3.764705882	5.117647059	-1.352941176	1	3
12	3.058823529	4.823529412	-1.764705882	2	3
13	3.470588235	4.941176471	-1.470588235	2	3
14	4.058823529	5.176470588	-1.117647059	1	3
15	3.882352941	5.411764706	-1.529411765	1	2
16	4	5.352941176	-1.352941176	1	2
17	3.705882353	4.470588235	-0.764705882	1	3
18	4.058823529	5.117647059	-1.058823529	1	3
19	4.705882353	5.411764706	-0.705882353	1	1
20	4.294117647	5.470588235	-1.176470588	1	1
21	4.058823529	5.294117647	-1.235294118	1	2
22	3.705882353	5.117647059	-1.411764706	1	3
23	3.764705882	5.117647059	-1.352941176	1	3
24	4.294117647	5.294117647	-1	1	1
25	4.588235294	5.411764706	-0.823529412	1	1
Median	**3.5**	**3.5**			
Mean	**4.209411765**	**5.277647059**	**-1.068235294**	**1**	

Description	Performance	Frequency	Percentage	(%)
1. HIGH LEVERAGE	+	+	22	88%
2. PRIORITY TO IMPROVE	+	–	3	12%
3. IGNORE	–	–	0	0%
4. RESOURCE ALLOCATION	–	+	0	0%
		TOTAL	25	100%

Table 6.
Gap Analysis and Quadrant Mapping IPA

Based on the Table 6, there are three dimensions/indicators which are located in the second quadrant (priority to improve): social tags/folksonomies (No. 6), wikis (No. 12) and podcast (No. 13) highlighted using red symbol in Figure 2. This data is in harmony with the observation done towards universities' websites in Sophistication Index (SI), where podcast has not been the main feature because universities are still depending on greetings/messages in text form (see Table 3). The detailed image of quadrant mapping on this gap analysis can be seen in Figure 2.

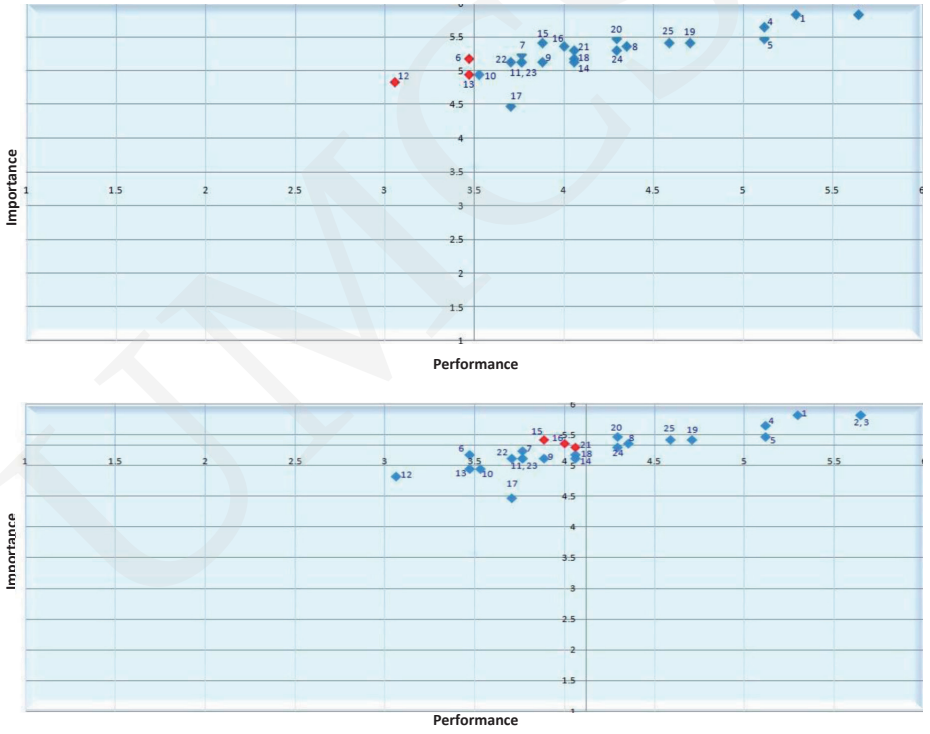

Figure 2.
Importance-Performance Analysis (IPA) – media axis (above), mean axis (below)

The second IPA method uses respondent valuation approach, which is divided into two parts, namely 1–3 for low valuation and 4–6 for high valuation (Sigala and Chalkiti, 2014). Each of these valuations are mapped based on the importance and implementation into 4 scenarios: (A) indifference (low performance, low importance), (B) wasting time and resources (high performance, low importance), (C) missing opportunity/gap (low performance, high importance) and (D) effective use (high performance, high importance) as seen in Table 7.

Table 7.
IPA scenario based on respondents' valuation

companies initially push their products to customers. Currently, it has become a conversation between companies and customers. This means customers work together with companies to create a suitable and valuable experience for		2014:3731 Heath, Singh & Ganesh, 2014:585, 588, 589

The more detailed processed data can be seen in Table 8.

	Dimension/Indicator	...as community with mutual interest/practice, consisting of people who interact one another on certain domain, for example: profession club	Greenberg, 2010:44 Mohan, Choi & Min, 2008: 242 Heath, Singh & Ganesh, 2014:590, 592 Olivera, Sita & Sasa, 2013:347-351 Mousavi & Demirkan, 2013: 720	22
	Communities	A group of people who has a specific mutual characteristic	Mohan, Choi & Min, 2008: 242 Heath, Singh & Ganesh, 2014:588 Olivera, Sita & Sasa, 2013:351 Mousavi & Demirkan, 2013: 720	23
	Collaboration	Relationship of one another which gives valuable benefits	Greenberg, 2010:44 Mohan, Choi & Min, 2008: 240	24
	Context	How a previously-made profile will be used to define what is intended, what is seen, and how it is seen, for instance: status is made to let other people know what we need	Greenberg, 2010:45 Bekmamedova & Shanks, 2014:3730, 3732 Heath, Singh & Ganesh, 2014:585, 588, 589, 590 Olivera, Sita & Sasa, 2013:348 Olivera, Sita & Sasa, 2013:351 Mousavi & Demirkan, 2013: 718-724	25

Table 8.
IPA based on respondents' valuation

According to the Table 8, there are 9 dimensions/indicators (green color highlight) in category D (effective use – low performance, high importance): social media account, institution identity, official photos, official videos, comments, bookmarks, reputation, relationship and context. While in category C (missing opportunity/gap – low performance, high importance), there are eight dimensions/indicators: social tags/folksonomies, rating, ranking/indexing, wikis, podcasts, email, forum and presence/instant messaging. Thus, category C needs to be the main priority due to its high respondents' expectation value, but with a low implementation value.

4.3. Discussion

The research results show the existing problem: web 2.0 and social media adoption have been accomplished by universities, but have not reached an optimal result. As seen

in Table 3, there are only 3 features which are above 60%: realtime webcast of events, widgets and social network for the users of the university website. The presence of social media has reached a good result for Facebook page, LinkedIn and Twitter (above 70%). The usage and effectivity in social media shows a better result, based on the average number of followers/fans and activities done by the social media accounts (see Table 4). It is in accordance with the previous research by Bonson et al. (2012) that web 2.0 and social media have been paid more attention to by universities especially in order to maintain communication, but the usage has not been managed optimally.

The perception of social media importance and implementation level on Social CRM in universities in Indonesia has been good enough (only 3 dimensions/indicators need to be improved) and shows a similar perception in observing the dimensions/indicators considered as the most essential (there are 9 dimensions/indicators). This is parallel with the previous research done by Greenberg (2010) about social stack in building social CRM.

Based on Table 8 and entropy calculation in Table 5, there are dimension/indicator similarities on the top 9 position even though the order is a little bit different (green color highlight). On the 10th position and afterwards, things are completely different. This happens because the importance opinions according to respondents have possessed the similar indicator in observing social media application on Social CRM implementation. A consistent result can be seen as well when Table 6 and table 6 are being compared to find out areas which need to be improved by universities. The areas themselves are: social tags/ folksonomies, ranking/indexing, wikipedia and podcast (orange color highlight).

These research results show that social media has a positive impact on makerting because social media is a competitive marketing tool able to attract new customers and retain old customers (Öztamur and Karakadilar, 2014).

5. Implication

According to the detailed discussion above, more people are using social media to maintain relationships with others and to look for information. On the other hand, the information provided by universities is still in one-way attribute and not optimal yet. That is why universities have to pay more attention to the content quality which will be delivered to society, students and student candidates. Regarding web 2.0 and social media adoption, universities need to improve on several things: social tags/ folksonomies, wikis and podcast. A personally-managed content classification by users will be assisting them when finding the desired information (social tags/folksonomies). Users will be able to edit the content altogether at once in the website, thus a complete information will be provided (Wikis) and audio files could be obtained by subscribing or downloading them into computer or wireless music device. This will help customers with listening and repeating the desired contents (podcast).

The implication of this research on science is an emphasis on the previous researches indicating that social media usage is very important in implementing Social CRM because it acts as a supporting tool to listen to customers' conversation (Askool and Nakata, 2010; Greenberg 2010). However, the usage is not optimal yet because it just relies on the communication not as a principal in developing an organization's website (Benson et al., 2012).

6. Limitation and Further Research

The limitation of this research is that the number of university respondents should be enlarged and taken not only from Jakarta but from all over Indonesia. The initial selection of respondents was only universities in Jakarta because of considerations of competence and capability of the university as well as the availability of adequate Internet infrastructure.

Further studies of this research is to find the preference of social media usage from the perspective of prospective students, students and alumni. These preferences will help universities to select and define the social media that will be provided by the university in order to assist customers in finding information for choosing the university and to enhance customer engagement.

7. Conclusion

To conclude, the adoption of web 2.0 and social media has been done by universities on their websites. The web 2.0 usage has not been fully optimal, since only two out of five features have reached more than 80%: realtime webcast of events and widgets; and one feature has not been used at all: podcast from the management (0.00%). Social media usage shows higher universities' euphoria in exploiting social media as one of the communication channels towards the society, students and student candidates. All universities are utilizing Facebook page (100.00%) and many LinkedIn (84.48%), Twitter (70.69%) and YouTube (51.72%). However, the attached social media links which are used in their offical websites are not optimal yet because not every one of them publish their social media links in their websites (only 67.24%). The social media has been used for daily activities on Facebook and Twitter.

Based on importance-performance analysis (IPA), there are nine good dimensions/indicators which need to be maintained (owning social media account, university's identity, offical photos, official video, relationship, bookmarks, reputation, context and comments) and three dimensions/indicators which need to be improved: social tags/folksonomies, wikis and podcast.

In the future, universities have to work on some improvements: publishing social media accounts on their websites, intensify social media usage as the source of trusted information and updating daily information (daily activities), putting social media as a tool to capture customers' conversation in order to recognize their needs, maximizing YouTube in delivering digital contents (videos) about the university, improving social media function (social tags/folksonomies, wikis and podcast) to increase the number of customers who are willing to to join the official universities' social media.

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