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Abstract

While organizations strive to leverage the vast information generated daily from social media platforms and both decision makers and consultants are keen to identify and exploit this information's value, there has been little research into social media in the business context. Social media are diverse, varying in scope and functionality, this diversity entailing a complex of attributes and characteristics, resulting in confusion for both researchers and organizations.

Taxonomies are important precursors in emerging fields and are foundational for rigorous theory building. Though aspects of social media have been studied from various discipline perspectives, this work has been largely descriptive. Thus, while the need for a rigorous taxonomy of social media is strong, previous efforts to classify social media suffer limitations – e.g. lack of a systematic taxonomic method, overreliance on intuition, disregard for the users' perspective, and inadequate consideration of purpose.

Thus, this study was mainly initiated by the overarching question "How can social media in the business context be usefully classified?" In order to address this gap, the current paper proposes a systematic method for developing a taxonomy appropriate to study social media in organizations context, combining Nickerson et al,'s (2012) IS taxonomy building guidelines and a Repertory grid (RepGrid) approach.

Keywords: Social media, classification, taxonomy, social media in business context, repertory grid

1.   INTRODUCTION

Social media is increasingly enmeshed in contemporary society (Chui et al. 2012), this rapidly evolving phenomenon transforming ways of interacting, working, creating value, knowledge acquisition and innovation (Urquhart and Vaast 2012). Social media are diverse, varying in scope and functionality. Some target the general public (e.g. Facebook); others are more focused (e.g. LinkedIn - focused on professional networks). Some emphasize media sharing (e.g. Youtube, Flickr), while others, such as weblogs, are popular because they are easy to create and maintain (Kietzmann et al. 2011). This diversity entails a complex of attributes and characteristics across different social media (Kaplan and Haenlein 2010), resulting in confusion for both researchers and organizations.

Though aspects of social media have been studied from various discipline perspectives, including sociology (Kluemper and Rosen 2009; Parra-López et al. 2011), marketing (Michaelidou et al. 2011; Weinberg and Pehlivan 2011) and information systems (Kaplan and Haenlein 2012; Vuori 2012), these works have been largely descriptive and confusing regarding what exactly the word "Social media" include/exclude. "although most people would probably agree that Wikipedia, YouTube, Facebook and Second Life are all part of this large group, there is no systematic way in which different Social Media applications can be categorized" (Kaplan and Haenlein 2010).

On the other hand, although IS researchers are increasingly embracing social media environment as their study context, IS community has not yet been sufficiently engaged in reflecting upon methodological aspects of researching social media and subsequent application for theory building (Urquhart and Vaast 2012). The development of taxonomies or classifications based in salient characteristics of the phenomenon of research interest, is also foundational for rigorous theory building in any field (Iivari 2007; Nickerson et al. 2012; Williams et al. 2008). Williams et al. (2008) suggest that taxonomy development is the first step to distinguishing between different characteristics of objects of interest and developing rigorous theories. Bapna et al. (2004) argue taxonomies are a perquisite to developing ex post theories. Glass & Vessey (1995) suggest that taxonomies can organize and structure the body of knowledge, for advancement of the field. They further suggest a taxonomy is an important precursor in emerging fields (Glass and Vessey 1995).

Taxonomies have been developed in the IS discipline to study emerging technologies. Empirical taxonomies can help to develop knowledge related to the desired phenomenon and fuel research on effectiveness of different types (Sabherwal and Robey 1993). Glass and Vessey (1995) argued that taxonomies describe the area of interest systematically and can suggest future [IS] development needs. They further suggest that a taxonomy of [IS] applications would pave the way to theory of applications and theory of software development.

Thus, developing taxonomy of social media in IS and in relation to business use of social media is the critical step toward developing theories and future publication in social media environment. In order to satisfy this need, this study first defines taxonomy and taxonomy development methods. Then reviews previous attempts to classify social media to identify gaps and deficiencies in existing classification schemes and subsequently propose a systematic taxonomy development method which is appropriate for social media context.

2.   LITERATURE REVIEW

2.1   A preliminary overview of taxonomies and their development

With the goal of building a taxonomy for social media in the business context, it is necessary to adopt a specific definition of the word 'taxonomy' as used in this study. Before proceeding, the differences between classification, taxonomy and typology which have been used interchangeably in the literature, should be clarified (Carper and Snizek 1980; Doty and Glick 1994). Classification systems arranges

entities into a set of classes based on their similarities (Bailey 1994; Mayr and Bock 2002). Mayr & Bock (2002) define classification as "the arrangement of entities in a hierarchical series of nested classes". Each class in a classification scheme is a constructed, useful abstraction of similarities of classified phenomena (Parsons and Wand 2008). The word classification is used to refer to both product and the process of organizing objects of interest (Glass and Vessey 1995; Nickerson et al. 2012). Typology is another term used in ordering systems, Bailey (1994) distinguishes typologies from classification to be multi-dimensional and conceptual, and also argues that typologies are more complex than classifications. Doty & Glick (1994) emphasize the complexity of typologies and suggest that "typologies are conceptually derived, interrelated sets of ideal types that are believed to determine the relevant outcomes". Taxonomies, like classifications, are used to refer to both the process and the results of grouping objects (Bailey 1994; Nickerson et al. 2012). Bailey (1994) has used the word taxonomy for empirical classifications and points out that taxonomies also refer to a theoretical basis of classifications. However, Doty & Glick (1994) do not differentiate between a taxonomy and a classification and define both as "categorizing phenomena into mutually exclusive and exhaustive sets with a series of discrete decisions. Bailey (1994) suggests using the word taxonomy for classification systems which are derived empirically, and typologies for those which are derived conceptually. Consistent with Doty and Glick (1994) and Nickerson et al. (2012), in this study, the term taxonomy is used to refer to both empirical and conceptual classification systems.

Developing a taxonomy is a complex process and there are different approaches and related principles. Research in biology and social science has used different kinds of taxonomies and classifications (Nickerson et al. 2012). In social science, Bailey (1994) has suggested two main approaches for developing a taxonomy, aligned with his distinction between conceptual classifications and empirical classifications. For conceptual classifications (typologies) he suggests a deductive approach to derive the dimensions from a theoretical basis. Empirical methods begin with a data set of empirical objects, measured on a number of variables. Cluster analysis or other numerical approaches can be used to group the cases by overall similarities. Bailey (1984) suggested that the most effective way to develop a taxonomy is to use a three level model that includes conceptual, empirical and indicator levels (Indicator level or operational level, is a combination of both conceptual and empirical methods). The researcher can start with either an empirical or conceptual method and then examine the outcomes using a combination of both. Based on this approach, Nickerson et al. (2009) has suggested a methodology which includes both empirical- deductive and deductive-empirical approaches in a recursive manner, and ends up with an evaluation phase which uses the suggested taxonomy to classify new objects.

Taxonomy development literature rarely state clearly what are the metrics for evaluating a taxonomy, in particular on its usefulness and effectiveness (Nickerson et al. 2012). Bailey (1994) suggests the only basic rule to form the classes is that they should be exhaustive and mutually exclusive. Parsons & Wand (2008) argue that a good class should necessarily capture the domain of knowledge effectively and efficiently. Williams et al. (2008) applied their suggested taxonomy in the related context in order to study its usefulness. Although the only sufficient condition in which usefulness of a taxonomy can be evaluated is when it is applied in the related context, Nickerson et al. (2012) suggest a comprehensive set of essential criteria for developing a useful taxonomy, derived from the literature. These criteria include: conciseness, robustness, comprehensive, extendible and explanatory. These conditions are also consistent with criteria and definition of dimensions in the classification system according to analytic theory1 (Gregor 2006).

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1 Analytic theory describe or classify specific dimensions or characteristics of individuals, groups, situations, or events by summarizing the commonalities found in discrete observations Gregor, S. 2006. "The Nature of Theory in Information Systems," MIS quarterly (30:3), pp. 611-642.

2.2   Social media classifications (literature review)

Prior to commencing primary taxonomic development, an archival analysis of existing taxonomies or classification attempts of any sort in the broad social media domain was conducted, where literature was systematically collated, analyzed and synthesized to determine the gaps and confirm the motivations of this study (since the topic of social media is relatively new, very few studies were anticipated to be found, hence, we tried not to exclude any publications). An archival analysis approach suggested by Bandara et al. (2011) was adopted, which is based in prior literature review methods such as Webster and Watson (2002), Levy and Ellis (2006) and Vom Brocke et al. (2009), and has been applied in prior studies on typology building (e.g.(Miskon et al. 2013)). This section presents a summary of tasks completed and results of this effort.

In the paper extraction phase [limiting the search to full text studies following (Woldwinkel et al, 2011) and (Bandara et al 2011)], first, appropriate domains/fields of research and related sources to search were identified. Because social media publication channels are scattered, this study focused on online databases from different disciplines (Ngai and Wat 2002). This approach has become popular in the IS discipline to search contemporary phenomena (Sabherwal et al. 2006). To cover a range of different disciplines, the search was conducted through Google Scholar as a general database, Proquest and EBSCO as business databases, and ACM and IEEE as databases in IS.

According to the study goal and terminology of social media[2] (Kaplan and Haenlein 2010; OReilly 2007; Sinclaire and Vogus 2011), and consistent with literature review methods (Bandara et al. 2011; Wolfswinkel et al. 2013; Yang and Tate 2012), the following search query was used to search in the title, abstract and keywords across the databases for all years ("Social media" OR "Social network" OR "web 2.0") + (Taxonomy OR classification OR typology).

The next step was to check the relevance of the extracted papers and select those that would be included in the analysis. After the first round of paper extraction, the search results were filtered, excluding those unrelated to the study goal, checking title, abstract and index terms if existing. After the first round of filtering, 176 papers were imported to endnote. In the next level of filtering, these papers were checked manually to extract those mentioning some kind of classification of social media, web 2.0 applications or social networks. Looking further to body of the text, many addressed text classification, tagging and topic classification issues in social media. These papers also were excluded from the sample. Next, forward and backward citation tracking was conducted using the selected relevant papers to make the sample of papers extracted as complete as possible (Bandara et al. 2011; Wolfswinkel et al. 2013). Finally 30 papers were selected which had clearly mentioned a social media classification, consistent with the intent of this effort. From these 30 papers 8 of them were excluded because they were using developed taxonomies by other scholars (e.g. (Chaudhary 2011; Tuomela 2010) which used (Kaplan and Haenlein 2010) classification and (Parent et al. 2011) which used (Fraser and Dutta 2010) suggested classification) than building one. The resulting 22 classifications were reviewed and analysed, as summarized in Table 1.

Nickerson et al (2012) have explained the importance of defining users and their expected use of taxonomy in developing a useful and robust taxonomy. Baily (1984) and later Nickerson et al (2012) have also emphasized on using a structured approach which is the combination of conceptual and empirical methods in developing taxonomies. As a result, we analyse the extracted taxonomies regarding the purpose of the taxonomy, the users which eventually define the purpose of the taxonomy and the taxonomy development method. Table 1 presents the summary analysis (Column 1 indicating the source). Columns 3 and 4 extract Purpose and Users respectively, and how well they were stated (clearly stated, implied or not stated at all) was also noted. If clearly stated, the direct supporting quote(s) from the papers

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2 social media is defined as "a group of internet based applications that build on ideological and technological foundations of Web 2.0, that allows for creation and exchange of user generated content." Kaplan, A.M., and Haenlein, M. 2010. "Users of the World, Unite! The Challenges and Opportunities of Social Media," Business horizons (53:1), pp. 59-68.

are presented. If implied, our interpretations are provided. Column 4 first captures if an approach has been 'stated' (i.e. either in a dedicated section of the paper, 'implied' by discussion within the paper, or 'not stated' at all). It also captures implied logic employed to build the taxonomies; inductive (observing empirical cases) - deductive (conceptual and theoretical foundation)- intuitive (ad hoc approaches) (Bailey 1984; Nickerson et al. 2012).

The final mapping of the social media taxonomy papers to the elements of interest (as presented above) was confirmed by two coders, where a sample of the papers (15%) were independently mapped and compared. Any discrepancy between the two coders' results was discussed and resolved by revisiting the original papers.

Source (1)	Purpose (2)				Users (3)				Approach (4)					
	Clear	Implied	not stated	Purpose	Clear	Implied	not stated	Users	Clear	Implied	not stated	Inductive	Deductive	Intuitive
(de Kool and van Wamelen 2008)		✓		Categorizing Web 2.0 function used in E-government			✓	----			✓			✓
(de Kool and van Wamelen 2008)		✓		Categorizing Web 2.0 used in E-government			✓	----			✓			✓
(Bernoff and Li 2008)		✓		using social media in business			✓	----			✓			✓
(Constantinides and Fountain 2008)			✓	----			✓	----			✓			✓
(Hussein et al. 2009)	✓			"Guideline to analyse and design web 2.0 apps"	✓			"Researchers, Practitioners"	✓			✓		
(Kaplan and Haenlein 2010)		✓		creat systematic classification		✓		Researchers		✓			✓	
(Fortino and Nayak 2010)	✓			"using social media in business"	✓			"Business managers"		✓			✓	✓
(Bingley et al. 2010)			✓	----		✓		Researcher		✓				✓
(Fraser and Dutta 2010)			✓	----			✓	----			✓			✓
(Pallis et al. 2011)			✓	----			✓	----			✓			✓
(Weinberg and Pehlivan 2011)	✓			"guide marketing decisions"	✓			"marketing decision makers"			✓			✓
(Solomon et al. 2011)		✓		Collaborative use of SM			✓				✓			✓
(Shang et al. 2011)		✓		understanding how web 2.0 impact KM and learning process		✓		Firms	✓			✓		

(Turban et al. 2011)	✓		finding opportunities for internal collaboration		✓	----		✓		✓	
(Lombardi 2012)		✓	----		✓	----		✓			✓
(Baruah 2012)		✓	----		✓	----		✓			✓
(Baruah 2012)		✓	----		✓	----		✓			✓
(Ledford 2012)	✓		Channel selection	✓		Campaign designer	✓			✓	
(Ledford 2012)		✓	----		✓	----		✓			✓
(Yousif 2012)		✓	----		✓	----	✓			✓	
(Arora 2012)	✓		"Cultural Taxonomy"		✓	----	✓			✓	
(Pentina and Koh 2012)	✓		"Social media strategies in SMEs"	✓		"Marketing executives"	✓			✓	

Table 1.   Comparison of Social Media Classifications

Approximately half of the papers in the sample are from Business (Kaplan and Haenlein 2010), Management (Bernoff and Li 2008) and Marketing (Pentina and Koh 2012), a quarter from IS, and the rest from other disciplines such as communication and sociology. The classifications in Table 1 span a range of purposes. Among those that mentioned purpose (implicitly or explicitly – Column 2), eight (> 1/3) have considered the application of social media in a business context. However, according to Nickerson et al., (2012) a strong taxonomy should satisfy intended, specified users; and should be developed employing a credible, predefined approach. Table 1 shows that more than 60 percent of the taxonomies are based on an intuitive approach and just 3 of the 22 taxonomies has explicitly described their approach (even these 3 studies have not clarified why they are using such methods).

In general several researchers have offered limited classifications of social media, mainly based in differing functionality (Kietzmann et al. 2011; Lombardi 2012; Parent et al. 2011; Solomon et al. 2011). The rationale for selected criteria for differentiating is typically vague, with precise definitions lacking and a systematic method for taxonomic development rarely employed (Kaplan and Haenlein 2010). Most have proposed broad and general taxonomies, with only a few (e.g. (Bernoff and Li 2008)) developing taxonomies for specific purposes, such as social media for business applications. Several are built on theory, but these approaches are vague, not clearly describing method, purpose nor expected user, and not validated using empirical data.

This literature review suggests that while the need for a rigorous taxonomy of social media is strong, previous efforts to classify social media suffer several limitations – e.g. lack of a systematic taxonomic method, over-reliance on intuition, disregard for the users' perspective, and inadequate consideration of the purpose of the taxonomy.

3.   PROPOSED METHOD

Thus, there is a need for a social media taxonomy to be developed, employing a systematic approach with theoretical grounding(s), that can be empirically tested for hypothesized utility. To address this need, this study combines the taxonomy development method suggested by Nickerson et al., (2010) and RepGrid technique to propose a systematic method for developing a taxonomy of social media.

Nickerson et al.'s (2012) approach is a rigorous methodology which follows Design Science principles and combines conceptual and empirical methods to address users requirements in developing taxonomy. Nickerson et al. (2012) claim that their suggested approach; (1) reduces the arbitrary or ad hoc dimensions, (2) can be completed in a reasonable period of time, (3) is straightforward to apply by researchers of different levels of knowledge, and (4) leads to a useful taxonomy. Adopted from Bailey (1984), Nickerson et al. (2012) suggested two approaches towards building a taxonomy: conceptual/deductive [Starting with conceptual or theoretical foundations (Bailey 1994)] and empirical/inductive [Deriving classification from objects (Bailey 1994)], and explains how to apply them in an iterative process with clearly defined ending conditions[3] (an ending condition determines when to terminate the iterative process (Nickerson et al. 2012).

Despite the strengths of Nickerson et al.'s (2012) guidelines, they have not suggested appropriate empirical or conceptual methods to identify characteristics of desired objects. Nickerson et al.,(2010) approach assumes that researchers possess enough knowledge of either the phenomenon of interest or the domain of study. However, in this study context (social media applied in business context) this is not the case and the knowledge of researcher is limited both in empirical and conceptual domain. Nickerson et al., (2010) suggested that in such a situation researchers should investigate the domain of the study and choose different approaches to view the phenomenon from different perspectives. This study address this problem by integrating Nickerson et al.'s (2012) taxonomy building methodology with Repertory Grid (RepGrid) technique; which gives a firmer empirical base but also considers different perspectives (from multiple stakeholders) in the taxonomy development process (Tan and Hunter 2002).

RepGrid is a cognitive mapping technique that attempts to describe how individuals perceive a phenomenon in the real world (Tan and Hunter 2002). In this technique, the respondents are encouraged to give descriptive comments regarding the differentiation or similarities between objects of interest, hence, revealing the similarities and differences among constructs and elements, which are the basic requirements of any classification system (Mayr and Bock 2002; Tan and Hunter 2002). These descriptive comments are used to build characteristics of objects based on their similarities (Moynihan 1996; Tan and Hunter 2002). The cognitive maps produced using this technique can help to understand how different groups of users perceive characteristics of the objects of interest in different ways (Tan and Hunter 2002). When the researcher knowledge about the phenomenon of interest is limited (Such as the current study context) RepGrid helps to derive attributes of the objects of interest based on different group of users' experience and interpretations (in current study, business managers, IT department managers and scholars) with minimum biased from the researcher side (Hunter 1997).

A detailed process (see Figure 1) to develop a taxonomy for social media, adopting Nickerson et al.'s (2012) guidelines and integrating a RepGrid, is proposed. Consistent with Nickerson et al. (2012) this method starts with identifying users, defining meta-characteristics [4] (is the most comprehensive characteristic that will serve as the basis for choice of other characteristics in taxonomy) and determining ending conditions. The RepGrid approach is embedded to the Nickerson et al. (2012) guidelines to work through the multiple iterations. Due to the lack of theoretical foundations (Urquhart and Vaast 2012) and diversity of knowledge in social media, an empirical-to-conceptual approach where a RepGrid is embedded is suggested to avoid arbitrary selection of attributes (Nickerson et al. 2012). The process ends when the built taxonomy satisfies the determined ending conditions.

Figure 1 shows how different stages in the empirical approach of the Nickerson et al., (2012) methodology has been mapped to RepGrid design described by Tan and Hunter (2002). In a RepGrid, the

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3 Nickerson et al., defines two kinds of ending conditions: subjective and objective. The ending conditions can be chosen by the researcher according the taxonomy goals and context. For this study, ending conditions suggested by Nickerson will be applied because these conditions satisfy the definition of taxonomy and are consistent with analytic theory described criteria for a useful taxonomy Gregor, S. 2002. "A Theory of Theories in Information Systems," Information Systems Foundations: building the theoretical base), pp. 1-20.

4 To develop taxonomy of SM in business context, the meta-characteristics could be how organizations apply social media in their activities.

term element is used to refer to a sample of objects and the term construct represents perceptions from the respondents' which captures which characteristics form differentiations amongst the elements. The suggested linking stage reveals participants' views of the elements in relation to the constructs determined (Tan and Hunter 2002). These three stages in RepGrid can be applied to conduct the core stages of the empirical approach in Nickerson et al.'s (2012) methodology. Consistent with Nickerson et al. (2012) after the first iteration, the built taxonomy will be evaluated against ending conditions and the iteration will continue with a new group of respondents or new sets of social media if ending conditions are not met.
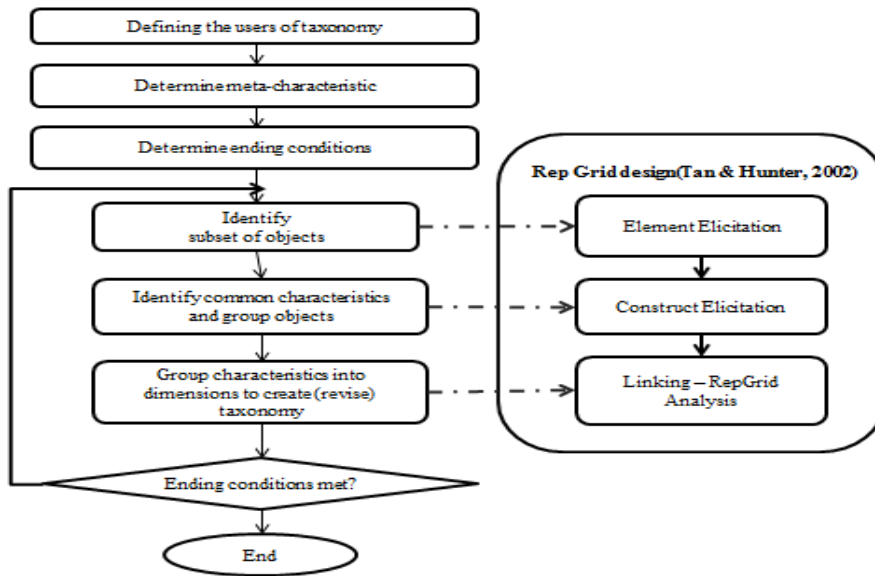

Figure 1. Proposed taxonomy development method for social media adopted from (Nickerson et al. 2012)

4. CONCLUSION

This study is driven by the overarching question "How can social media in the business context be usefully classified?" In order to address the overarching question, this study proposes a systematic method to characterize social media as the first step toward developing a taxonomy specific to social media use in organizations. Prior to commencing primary taxonomic development, an archival analysis of existing taxonomies or classification attempts of any sort in the broad social media domain was conducted. The results of this review revealed that though several studies are built on theory, but approaches are vague, not clearly describing method, purpose nor expected user, and not validated using empirical data. This literature review suggests that social media taxonomy is in gestation in all disciplines.

There is thus a need for social media taxonomy to be developed, employing a systematic approach, having theoretical grounding that can be empirically tested for hypothesized utility. We adopt Nickerson et al.'s (2012) approach, which is based on a detailed review of taxonomy literature from different disciplines. It is rigorous and follows design science principles. It is also flexible leading to develop the most useful5 or optimal taxonomy in the related context through an iterative methodology. Nickerson et al. (2012) do not suggest appropriate empirical or conceptual methods to identify characteristics of

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5 To satisfy the expected use of taxonomy by eventual users of the taxonomy Nickerson, R.C., Varshney, U., and Muntermann, J. 2012. "A Method for Taxonomy Development and Its Application in Information Systems," European Journal of Information Systems).

desired objects, thus our proposed approach extends the Nickerson et al.'s (2012) taxonomy methodology by integrating a Repertory Grid (RepGrid) approach, which gives a firmer empirical base, also considering differing perspectives (from multiple stakeholders) in the taxonomy development process. Work is next commencing with executing the study design arrived at.

This study contributes to research by suggesting a systematic methodology to develop social media taxonomy in any context and with different motivations, which can be used by both researchers and practitioners. Work is next commencing with executing the study design arrived at. However, employing this method in real world might necessitate some revisions in defined steps of methodology. Although RepGrid is a well-known method in deriving attributes of the phenomenon of interest but this method has not been used yet in order to develop taxonomies or classifications. The strength and weakness of the proposed method can only be identified through applying it in the context and as the next step of this study.

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