

The e-Visibility Maturity Model

Assessing Stages of Visibility Evolution for e-Business

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Abstract: This paper suggests a model to measure e-visibility - the e-Visibility Maturity Model (e-VM model) that is used to assess the visibility of a company or set of companies in the global e-business market. The visibility is measured using company's involvement in electronic interactions with customers that is externalized by the integration of the Social Software (SoS) in its other means of online presence. This approach allows evaluating company's adaptation to the challenges of the social web and scaling the evaluation to industry or country level. The evaluation of the maturity can be completed based on external presentation, i.e., the website, of the company allowing an efficient evaluation process. The suggested maturity model for assessing e-visibility is based on related work in the area of maturity assessment in e-business. Its application is illustrated in a case where the e-VM for specific countries across industries is assessed, based on a sample of 1600 enterprises from four countries.

1 INTRODUCTION

The introduction of the internet opened a new procurement channel for enterprises that allows reaching the customers all over the world. The upcoming of the SoS in the recent years enforced this development by making a fast and even real-time interaction between customer and enterprise possible. While e-business required not only the introduction of new technologies in the routine or commonly known business processes, it also initiated the change of the mode of customer communication. Building on this technology, introducing SoS in this context supports the paradigm of the immediate interaction with the customer, and it also adds the aspect of inter-customer communication and opinion formation. This aspect leads to the state where not only the company and the customer communicate with each other, but also customers communicate among each other about the company in real or almost real-time. For the enterprises SoS provides, if managed correctly, an opportunity to get a good insight about customers' attitude as well as an opportunity to spread commercial information using the customer as an information channel enabled by the SoS. Recently enterprises in different countries and

different industries have accepted the challenge and involve SoS in their customer and product communication. SoS is considered here as an internet-based application that requires user interaction (Bryant, 2006). The term interaction is used here synonymously to "interactivity" that is defined by (Rafaeli and Sudweeks, 1997) as a "condition of communication in which simultaneous and continuous exchanges occur, and these exchanges carry a social, binding force". This definition further implies that interactivity can be shown to lead to more cooperation and socialization (Rafaeli and Sudweeks, 1997). Based on this definition as well as the social presence theory (Gefen and Straub, 2004) this paper explores the question of how to assess the different levels of maturity of the visibility of an enterprise for an online customer. This paper employs a suggested maturity model - the e-VM model - to explore the degree of the involvement in a mutual customer-firm interaction. Thus, e-visibility is defined here as the potential to interact and involve the customer in the e-market through the given, i.e., presently possible, means of communication. This model aims to assess the visibility of an enterprise in the e-business marketplace by exploring its usage of the possibilities provided by the internet in general and

by SoS in particular. The model uses the social presence theory (Gefen and Straub, 2004) to develop its maturity stages and it is based on the argument that SoS allows firms engaging in timely and direct end-consumer contact at relatively low cost and higher levels of efficiency than can be achieved with more traditional communication tools. This argument results from the findings that show that SoS enables a higher social presence of an enterprise and therefore a higher influence on customer's behavior (Kaplan and Haenlein, 2010). Beside the SoS, the maturity model also involves more "classic" means of customer communication.

The social presence theory (Gefen and Straub, 2004) states that media differ in the degree of "social presence"—defined as the acoustic, visual, and physical contact that can be achieved—they allow emerging between two communication partners. Social presence is influenced by the intimacy (interpersonal vs. mediated) and immediacy (asynchronous vs. synchronous) of the medium, and can be expected to be lower for mediated than for interpersonal, and for asynchronous than for synchronous communications. The higher the social presence, the larger the social influence that the communication partners have on each other's behavior (Kaplan and Haenlein, 2010). Based on these arguments, stages of a suggested e-VM model as well as the specific indicators were designed.

To assess the degree of the visibility of a firm, the concept of a maturity model has been adopted as a maturity model provides levels, or stages, for a class of objects representing an anticipated, desired, or typical evolution path of these objects (Becker et al., 2009). Maturity is defined as "a measure to evaluate the capabilities of an organization with regard to a certain discipline" (Becker et al., 2010). Here the measured capability is visibility of an enterprise for the customer on the web-landscape, and the discipline is the positioning of the company along the possible e-visibility maturity levels. As a result, based on the assessed maturity, improvement or strategic measures can be addressed (Pöppelbuss and Röglinger, 2011), (Morais et al., 2007).

The outcome of this paper is a model that can be used in research and practice in the broad context of e-market assessment. Since the suggested e-VM model provides indicators for the current state and development of an enterprise as well as indicators for benchmarking, this paper provides insights for strategic managers in enterprises that are already present on the e-market or are planning to enter the e-business, as well as for scholars and marketing practitioners and thus can serve as a foundation for

future research on interorganizational systems. Usage of the e-VM is illustrated on a case where the model is scaled to compare e-VM across industries in four different countries.

The paper is structured as follows: first the relevant related work on maturity definition in the context of e-business is presented. Then, the suggested e-VM structure as well as the model is described based on the accordant research design. In section five the case of e-VM application is presented. Conclusion and outlook finish the paper.

2 RELATED WORK

(McKay et al., 2000) proposed an e-business maturity model, the Stages of Growth for e-business (SOG-e model), based on the model by (Galliers and Leidner, 2004). The model focuses on technological aspects of e-business growth. (Chan and Swatman, 2004) focused on the development of the business to business (B2B) stages of growth model. They reviewed the literature on stages of growth models and studied the development of the e-commerce in one Australian company. They defined four maturity levels and five dimensions of the e-commerce development: Initial e-commerce; Centralized E-commerce initiative; Looking Inwards for Benefits; and Global e-commerce. (Rao et al., 2003) proposed e-commerce stages of a growth model for small and medium sized companies. Their model consists of four stages: Presence, Portals, Transactions and Enterprises.

The maturity models in e-business described above focus on the internal structure of the business. Nevertheless, the growing number and importance of SoS requires its integration in the assessment of the role of an enterprise in e-business. Thus, the e-VM model we offer here focuses on the external aspects of the enterprise presentation and customer communication. It also takes the challenges (e.g., security) and opportunities (e.g., social bookmarking) offered by this development into account.

3 A FRAMEWORK FOR ASSESSING E-BUSINESS VISIBILITY

3.1 Research Design

The e-VM model that is introduced here is based on the statistical analysis of internet presence of 1600

enterprises from four different countries: Germany, The Netherlands, Israel, and Russia (400 per each) and 27 different industries (e.g., fashion, higher education, real estate, and healthcare). This analysis was conducted using different variables, which were transformed into indicators of the suggested e-VM model. Employing the methodology suggested by (Mettler, 2011), the model is illustrated using the case of various countries.

The object of analysis (e.g., a company) is analyzed based on its external virtual appearance, i.e., the webpage, without taking the internal processes and their support into account. The dimensions of the analysis are defined here as e-visibility dimensions and are translated into operative and measureable indicators using specified criteria. Each indicator is measured by a scale that produces a score used to position the object of analysis into a specific stage that defines its current state of e-visibility (see table 1). Thus, using the suggested e-VM model, the position of an enterprise as well as its relative position can be evaluated.

3.2 Structure of the e-VM Model

The scope of the e-VM model is the B2C interaction of enterprises. The model can be used to assess the e-VM of an enterprise as well as be scaled to sets of enterprises, to analyze a specific industry, or the benchmark between industries as well as broader sets of businesses. It is suggested that the e-VM model provides five possible stages for the enterprise e-visibility evolution analysis: 'the invisibles', 'the beginners', 'the niche players', 'the sociables', and 'the celebrities'. These stages are aligned along four dimensions:

1. Level of interactivity: based on the definition of interactivity by (Rafaeli and Sudweeks, 1997) and their claim that interactivity can be shown to lead to more cooperation and socialization (Rafaeli and Sudweeks, 1997) we measure interactivity as an indicator of mutual communication. Here the question about how much the e-communication with the customers is mutual is answered by using the indicators: online presence, interaction mode and intensity as well as level of potential commercial activity.

2. Level of globalization: This dimension was developed based on the analysis of factors impacting involvement in e-business (Fillis et al., 2004). The focus is put here on the extent to which the e-communication targeting global and/or local populations. Here the indicators are: language of the online presence as well as the type of SoS used.

3. Level of sociability: (Cyr et al., 2007) who focus on the role of social presence in e-Service provide the theoretical basis for this dimension. Here the extent of the social presence of the enterprise that is supported by SoS use is questioned, using the activity of firms in SoS as indicator.

4. Level of security: (Jones et al., 2000) studied trust, privacy and security in e-business. Their conceptualization assisted in developing this dimension. The focus here is on the usage of international standards or national certificates to ensure secure transactions if online purchase is possible.

To assess the specific e-VM of an object of analysis, these dimensions are translated into evaluation criteria. Each criterion is further assigned to its components to assess the current e-VM state of the object of analysis (see table 1). The score values are based on the definition of social presence theory (Gefen and Straub, 2004) as well as the definition of interactivity (Rafaeli and Sudweeks, 1997) and its resulting stage.

3.3 Definition of the e-VM Stages

The e-VM stage of a firm or a set of firms (country or industry) is analyzed and defined using the scores assigned to the criteria as shown in table 1. The table provides the scores that can be assigned to one evaluated firm but also the score calculation and assignment for the case where the e-VM of several firms, i.e., firm sets, need to be evaluated. Score assigned to a set of firms is based on the relative number of firms with a specific value for an indicator. First it is defined whether a firm has an online presence at all. Based on this result the online presence is eventually analyzed according to the further criteria mentioned in table 1.

Static presence of an enterprise in SoS is defined here as the sum of the factors such as: having a link from the enterprise homepage to a social site, having a profile on a social site, providing bookmarking or sharing possibilities on the enterprise's website. While the static presence in SoS states a rather low interaction level, dynamic presence describes an almost real-time interaction pattern with the customer. Thus, the indicators of dynamic presence include a microblogging account and a possibility for live chat with customer service.

Table 1: e-VM model: indicators and scores.

Evaluation criterion	Indicator	Indicator description	Score to be assigned to one evaluated firm	Score to be assigned to a set of firms
Webpage		Does the firm have a webpage?	Yes= continue No= 'invisible'	0% - 'invisibles' 0-50% - 'beginners' 51-100% - continue
Interaction mode	SoS links	A link to at least one SoS in the firm's website	Yes=1, No=0	1= 0-40% 2= 41-100%
	Intensity: classic interaction	The sum of all positive answers to the usage of mail, e-mail, contact-box, phone and fax.	0-5	1= 0-2.99 2= 3-5
	Intensity: dynamic interaction	The sum of all positive answers to the usage of Twitter account, link to tumblr, and chat	0-3	1= 0-0.99 2= 1-3
	Mobile application	Advertised on the webpage	Yes= 1, No = 0	1= 0-15% 2= 16-100%
	Product description	In the webpage	Yes= 1, No=0	1= 0-50% 2= 51-100%
The Interaction dimension score (max)			11	10
Purchase	Product order online	In the webpage	Yes= 1, No=0	1=0-50% 2=51-100%
	Payment online	In the webpage	Yes= 1, No=0	1=0-50% 2=51-100%
	Mobile purchase	In the mobile application	Yes = 1, No =0	1 = 0-10% 2 = 11-100%
	Payment: local	Involves the usage of specific means of payments that are common in the specific region, e.g. electronic cash (EC) in Germany.	Yes= 1, No=0	1= 0-50% 2= 51-100%
	Payment: global	Includes online payment possibilities such as Paypal as well as the usage of credit cards (visa, master card, etc.).	Yes= 1, No=0	1= 0-50% 2= 51-100%
The purchase score (max)			5	10
Language	Mono language or Multi language	Only one local language or multi language with or without English	If Mono language is largest= 1, if Multi (regional) is largest =2, if multi incl. English is largest =3	If 1 is largest= 1, if 2 is largest =2, if 3 is largest =3
The language score (max)			3	3
Presence in SoS	Static SoS presence intensity	The sum of links to static SoS in firm's webpage (e.g., instagram, YouTube)	Calculated sum of links (0-5)	1= 0-1.99 2= 2-5
	Dynamic SoS presence intensity	The sum of links to dynamic SoS in firm's webpage (e.g., Twitter, tumblr)	Calculated sum of links (0-3)	1= 0-0.99 2= 1-3
	nvolvevement in popular SoS	Accounts for Facebook, YouTube, and Twitter (FYT)	One point per each (0 to 3)	1=0-0.99 2= 1-3
	Globalization oriented SoS presence	Global to local SoS ratio. 13 Links to global SoS (e.g., Blogger, Facebook) and 10 links to local SoS (e.g., my.mail.ru, mainVZ).	(if Global=0 or local=0, i.e., no links to Global or local)=0 (Global/local < 1) = 1 (Global/local =1)= 2 (Global/local > 1) = 3	Same as for the evaluation of one firm, but based on the average Global/local ratio

Table 2: e-VM model: indicators and scores (cont.).

Evaluation criterion	Indicator	Indicator description	Score to be assigned to one evaluated firm	Score to be assigned to a set of firms
	Sharing possibilities	Links to Social Bookmarking sites (misterwong, Google+, delicious, digg, stumbleupon)	One point per each (0 to 5)	1= 0-0.99 2= 1-5
	SoS usage intensity	Sum of positive answers for 23 SoS (e.g., instagram, MySpace, etc.)	0-23	1= 0-1.99 2= 2-23
The SoS presence score (max)			42	13
Security Standards or Certificates	Registration with password	In the website	Yes=1, No=0	1= 0-50% 2= 51-100%
	Usage of https	Where there is registration in the website	Yes=1, No=0	1= 0-50% 2= 51-100%
	Usage of trust certificates	In the website	Yes=1, No=0	1= 0-50% 2=51-100%
The security dimension score (max)			3	6

4 SCORING THE E-VISIBILITY MATURITY

Based on the defined dimensions and using the scores of the evaluation criteria the e-VM of a firm, an industry or a country can be calculated.

The scores provided in table 2 are designed for the evaluation of the object of analysis, e.g., an enterprise. The relation between the scores and e-VM stages is shown in table 3.

The e-VM of an object of analysis can be assessed as being in one of the following five stages: invisibles, beginners, niche players, sociables or celebrities.

An object of analysis is assigned to the set of “invisibles” in e-VM terms if it does not have a website at all and thus offers only a limited amount of communication possibilities with the customer. Also, the customer data is not transmitted online, thus online security measures are not applicable and the interactivity is limited.

Beginners are objects of analysis that have started to emerge on the e-market but have not yet integrated the majority of the possible ways to engage with the customer. For the sets of analyzed objects it means that more than 0 but less than 50% of the set elements are presented online providing a threshold for the following e-VM stages.

As niche players an object of analysis is described that shows online presence, i.e., for sets more than 50% of the elements provide an online presence. This constrain is applied to all of the following stages of e-VM. Furthermore, niche

players show a limited amount of socialization, by focusing on the static aspects of the online presence. They are mostly involved in local or regional SoS and provide standard security measures for the management of the online customer data as well as enlarged portfolio of trust certificates. In addition, the niche player offers product description in regional languages. e-VM niche players concentrate on the specific country or region and do not offer a vast amount of online transaction possibilities.

Objects of analysis that have an online presence and are well integrated in the static SoS environment, meaning that they show static online presence as well as sharing possibilities and are involved in regional as well as global SoS are called defined as “sociables”. They also offer product descriptions and online content in regional languages as well as in English and provide a standard amount of security measures for online transactions.

The celebrities - in e-VM terms these are objects of analysis that are well integrated in regional as well as global SoS environment. They offer dynamic and static presence and thus an increased level of interactivity with the customer. Also, online purchase is enabled using globally accepted means. As a result security mechanisms are also highly developed for these firms.

4.1 Assessment of the e-Visibility

The e-VM of a firm is assessed based on its online presence, i.e., the website. The assessment does not

require any additional expertise in the business area of the object of analysis. Also, making an online purchase or visiting SoS link of the firm is not necessary for the assessment. This allows an efficient and objective assessment of the e-visibility, using the indicators from table 1 and assigning the scores as suggested in table 2.

Table 3: Scores related to maturity stages for one firm and a set of firms.

Maturity stage	Score Range by dimensions (firm / set of firms)			
	Interac tivity	Globalizat ion	Sociabi lity	Securit y
Invisibles	0 / 0	0/ 0	0/0	0/0
Beginners	1 / 1-2	1/1	1-3/1	1/12
Niche player	2-3 / 3- 6	2-3/ 2-4	4-10/ 2	1/ 3
Sociables	4-9 / 7- 13	4-5/ 5-7	11-27/ 3- 8	2/ 4
Celebrities	10-15/ 14- 20	6-8/ 8-10	28-42/ 9-13	3/ 5-6

To assess the interactivity dimension the interaction mode and purchase evaluation criteria are used. For the dimension of globalization the language evaluation criterion group as well as purchase criteria (local vs. global payment) as well as the globalization oriented SoS presence from the SoS presence evaluation criterion group are used. The security dimension is assessed by the security and trust evaluation criterion group. To assess the sociability dimension SoS presence evaluation criteria are used. It is important to note that no total or general score is calculated for an object. The rationale of the model requires four separate scores, one for each of the mentioned dimensions, so the object's e-visibility can be assessed and analyzed as described.

Scores shown in table 2 can also be used to assess the maturity of a set of enterprises. Accordant scores are presented in table 1 and their usage will be demonstrated in the following case where we analyze and compare e-VM of four countries across industries (see table 3).

5 APPLICATION OF THE e-VM MODEL: e-VM OF COUNTRIES

Here the e-VM Model is used to compare the e-VM between countries. The data was collected in four countries where each 400 enterprises across 27

industries were surveyed. Thus, for the survey of the webpage indicator all 1600 enterprises were analyzed while for the other indicators only enterprises with an online presence were surveyed.

Table 3 shows that the Netherlands have the highest percentage of firms with an online presence. The Netherlands is also leading in the interaction and online purchase areas. The payment methods were not assessed during this analysis due to methodological inconsistency. The usage of languages on the homepage also differs between the countries. While over the half of the companies in each of the surveyed countries uses only one language for the online presence, Israel is leading in the usage of regional languages, due to its high amount of different minorities, and Russian Federation does not use regional languages for the online content description at all. Israeli enterprises are also leading in the providing of sharing possibilities of the enterprise websites while The Netherlands show the highest involvement into popular SoS, general SoS usage intensity and the use of security standards and certificates.

The results show that The Netherlands are currently positioned on the highest maturity level of the e-visibility, followed by Israel and Germany that are currently on the crossroads towards the celebrity phase with Israel focusing on the regional aspect and Germany showing a relative sparse use of SoS for customer engagement. Russian Federation is in the beginners stage of e-VM as only 29% of the surveyed enterprises had an online presence (i.e., a website). The Russian enterprises with an online presence though, showed a significant interactivity and sociability level indicating a potential movement towards the celebrity stage of e-VM.

6 DISCUSSION AND OUTLOOK

In this paper a maturity model for e-visibility description was presented and its application was demonstrated on the comparison of e-VM across industries for specific countries. The insights allow an understanding of the areas of use of modern communication technology in e-business as well as discover potentials of their better integration as customer communication and engagement tools. The model provides general dimensions and indicators to assess the e-VM. These dimensions and evaluation criteria are further detailed by indicators. These indicators are based on the currently used SoS and communication means. Nevertheless, they can be

Table 4: Comparing e-VM between countries (across industries).

Indicator	Measure	Germany % of enterprises (score)	Netherlands %of enterprises (score)	Israel % of enterprises (score)	Russian Federation % of enterprises (score)
		n=400	n=400	n=400	n=400
	Webpage	82% (2)	85% (2)	79% (2)	29% (1)
Interaction mode	SoS links	23% (1)	12% (1)	20% (1)	54% (2)
	Intensity: classic interaction	1.75 (1)	3.21 (2)	2.67 (1)	2.74 (1)
	Intensity: dynamic interaction	0.37 (1)	1.35 (2)	0.92 (1)	1.0 (2)
	Mobile application	10% (1)	39% (2)	17% (2)	14% (1)
	Product description	99% (2)	100% (2)	97% (2)	97% (2)
Sum: Interaction mode		6 /10	9/10	7/10	8/10
Purchase	Product order online	28% (1)	79% (2)	31% (1)	51% (2)
	Payment online	N.A. (1)	33% (1)	27% (1)	21% (1)
	Mobile purchase	9% (1)	34% (2)	10% (1)	7% (1)
	Payment: local	N.A	N.A	N.A	N.A
	Payment: global	N.A	N.A	N.A	N.A
Sum: Purchase		3/6	5/6	3/6	4/6
Language	Monolanguage	64% (1)	54% (1)	52% (1)	68% (1)
	Multi (regional)	4%	6%	24%	0%
	Multi (global)	32%	40%	24%	32%
Sum: Language		1/3	1/3	1/3	1/3
Presence in SoS	Static SoS presence intensity	0.80 (1)	1.68 (1)	2.29 (2)	1.41(1)
	Dynamic SoS presence intensity	0.37 (1)	1.35 (2)	0.92 (1)	1.0 (2)
	Involvement in popular SoS (FYT)	0.90 (1)	2.35 (2)	0.94 (1)	1.26 (2)
	Globalization oriented SoS presence (Global/Local ratio)	1.46/0.25= 5.84 (3)	2.69/0.08= 33.63 (3)	1.67/2.03=0.82 (1)	1.46/1.46=1 (2)
	Sharing possibilities	0.40 (1)	0.09 (1)	2.26 (2)	0.31(1)
	SoS usage Intensity	1.83 (1)	2.78 (2)	2.16 (2)	2.41 (2)
Sum: SoS presence		8/13	11/13	9/13	10/13
Security Standads or Certificates	Registration password	35% (1)	65% (2)	36% (1)	62% (2)
	Standards (https)	35% (1)	57% (2)	19% (1)	15% (1)
	Trust	24% (1)	94% (2)	41% (1)	47% (1)
Sum: Security		3/6	6/6	3/6	4/6

adjusted to the changing communication landscape, while the dimensions and evaluation criteria provide a solid and sustainable framework. Thus, the model can be adjusted in scale as well as adopted to the changing online communication landscape.

Furthermore, the model shows potentials that can be used to define measures to achieve the aimed maturity stage. Future work will include case studies to assess the e-VM between individual firms that differ in size and scope, or between industries as

well as the exploration of the potential managerial measures that result from the model application.

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