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The Inclusion of E-Commerce Metrics in Strategic Planning: Results from an Exploratory Empirical Study

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Abstract

This research in progress paper reports on an exploratory empirical study that aims to identify what e-commerce metrics are commonly included in IT strategies, and to understand the motivations for their inclusion. The results of this study may help IS executives improving their e-commerce planning processes and provide insight in the way that e-commerce performance is currently assessed.

A survey instrument has been developed based upon strategic decision making theory. The survey was based on four e-commerce metrics: traffic volume, online sales volume, fulfilment level and site functionality. For each metric, we asked whether the organisation had recently included the metric in their IT strategy. We also asked their opinion on five statements on the metric (motivations to include the metric).

The survey has been set out at an online community of 600 IS executives and 6000 online subscribers of an IT magazine. At the time of writing the data collection period was just finished. The paper reports on preliminary regression analysis on the available sample data. Early analysis and interpretation indicates that uncertainty to improve the metric is a significant predictor for metric inclusion, while stakeholder pressure is not.

Research objectives and questions addressed

The uncertainties currently facing IS executives in the realm of e-commerce are clearly substantial. There are both technological uncertainties, organisational uncertainties and market uncertainties to deal with (Economist, 2000). Under these circumstances, deciding on general and IT strategies for e-commerce is no easy task, and opportunistic ways of dealing with strategies appear to be more appropriate than formal-rational approaches (Sauer & Burton, 1999; Hackney & Little, 1999). From an academic point of view, identifying useful strategies to improve e-commerce performance has been identified as a major research issue (Benbasat et al., 2000).

There are many ways to formulate strategies (Whittington, 1993), and one way is to formulate target levels for specific performance indicators, or *metrics*. The strategic plan of an organisation would then include the target level for such a metric, and the measures to take in order to achieve that particular level. In the context of e-commerce, a number of metrics or performance indicators

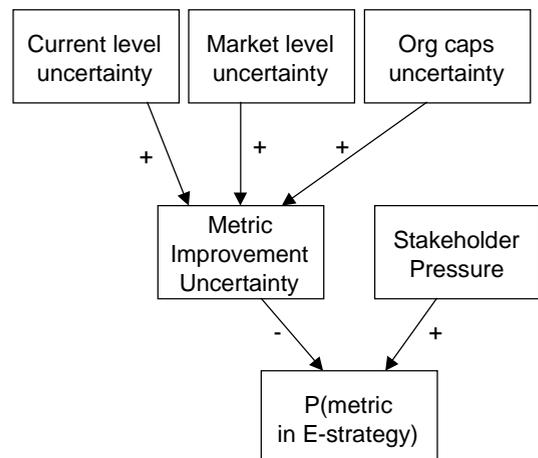
are available. Popular target metrics include online traffic and online sales (e.g. Quelch & Klein, 1996; Hanson, 2000). Other well-known metrics are fulfilment level (for example expressed in maximum number of days for delivery) and site functionality (for example expressed as the number of use cases, see Jacobsen et al., 1999).

In this research project, we examine the extent to which these metrics are incorporated in the strategic plans of the organisation. Furthermore, we aim to understand why certain metrics are included and why others are not. The results of this study may help IS executives improving their e-commerce planning process and provide insight in the way that performance of e-commerce metrics is currently addressed.

Theoretical foundations

The theoretical antecedents for this study are drawn from the literature on organisational decision making (e.g. Janis & Mann, 1977), strategic planning (e.g. Mintzberg, 1994) and to a lesser extent from the IS evaluation literature (e.g. Farbey et al., 1999; Earl, 1999). Our dependent variable is the inclusion of an electronic commerce metric in the strategic plan. The model is depicted in Figure 1.

Figure 1 Research model



Two working hypotheses can be derived from the model. In the first place, we hypothesize that

H1. The likelihood of metric inclusion is negatively associated with the perceived

uncertainty to improve the metric and positively with stakeholder pressure to improve the metric.

In any decision making process, the gathering of relevant information for the decision is a requirement for the decision process to be effective (Janis & Mann, 1977, p. 11). In the e-commerce context, it seems plausible to suggest that IS executives will have obtained insight in ways to improve a metric before they will include it in their strategies. This will allow them to set a target level that is operationally feasible. The importance of stakeholder pressure in decision making and strategic planning process has been argued in the literature (Mintzberg, 1994; Miller et al., 1996; Farbey et al., 1999). The assumption that IS executives align their strategies with general business strategies (from stakeholders) has been supported by empirical evidence (Burn, 1995; Reich & Benbasat, 1996; Lederer & Salmela, 1996). Thus, we argue that more stakeholder pressure will lead to increased likelihood of metric inclusion.

In the second place, we hypothesize that

H2: The perceived uncertainty to improve the metric is positively associated with the uncertainty about the current metric level, the uncertainty about the metric level of the market and the perceived uncertainty about the organisational capabilities to improve the metric.

With this hypothesis we propose that overall uncertainty about improving a metric is a function of three factors. The first factor refers to the knowledge of the current level on the metric. The second refers to the knowledge of the market. It has been suggested that a simpler external environment has a positive direct impact on the strategic IT planning process (Lederer & Salmela, 1996). More knowledge of the market and the competitors would decrease the uncertainty associated with metric improvement.

The literature on organisational decision making suggests that effective decision makers take into equal account the positive and negative consequences of a decision (Janis & Mann, 1977). Capabilities determine the degree to which e-strategies can actually be implemented, and hence approximate the consequences of a certain action.

Research methodology

To examine these working hypotheses we have adopted an exploratory survey research. Surveys are appropriate in exploratory research when a preliminary theory is available and the relative importance of antecedents or consequences is sought for (Hair et al.,

1998). In comparison to more qualitative research, the larger sample size of a quantitative study may cover a greater spectrum of the known variate. A survey instrument was developed for four e-commerce metrics: traffic volume, online sales volume, fulfilment level and site functionality. Statements that reflected the respondent’s perception of the independent variables were included for each metric. The survey was set out in an online community of 600 IS managers, maintained by a commercial company and 6000 subscribers on an online IT magazine. The respondents were invited to participate by E-mail. The E-mail contained a link to the webpage where the survey was located.

The study remained online for one month. The final set contains 463 respondents.

Preliminary analysis and interpretation

To analyse the data we conducted four logistic regression analyses to test hypothesis 1 and four multiple regression analyses to test hypothesis 2 (Hair et al., 1998).

A logistic regression (logit) analysis was conducted in order to assess the prediction value of metric improvement uncertainty and stakeholder pressure on metric inclusion. The results are in the following tables:

Table 1. Results Traffic and Sales

	Traffic Volume	Online Sales Volume
n	367	364
Nagelkerke R Square	0.113	0.141
B Uncertainty	-0.4034*	-0.5787*
B Pressure	0.3380*	0.3431*

* = p<0.005

Table 2. Results Fulfilment and Functionality

	Fulfilment Level	Site Functionality
n	357	357
Nagelkerke R Square	0.083	0.068
B Uncertainty	-0.5251*	-0.3722*
B Pressure	0.2081	0.1754

* = p<0.005

The results demonstrate relatively low Nagelkerke R squares across metrics, indicating about 10% of the variance in odds ratio explained. The data also suggests that metric improvement uncertainty is a significant predictor, while stakeholder pressure is not (except for traffic and sales). This appears to be in contrast with theory. To explain our findings, we are currently studying the limitations of our sample data, with the help of the control variables. A reason could be the time lags between variable changes. E.g. only after increased stakeholder pressure and decreased uncertainty may a metric become part of the strategy. There is a possibility that our respondents are only

very recently “pressed” by their stakeholders, and have not included the metric in a plan yet.

Below is a summary of the multiple regression results for the second hypothesis:

Table 3. Results Traffic and Sales

	Traffic Volume	Online Sales Volume
n	365	356
R Square	0.428	0.364
F	90.110*	67.485*
Beta Level Unc.	0.508*	0.357*
Beta Mkt Unc.	0.245*	0.355*
Beta Org. Caps	0.057	0.091**

* = p<0.005, ** = p<0.05

Table 4. Results Fulfilment and Functionality

	Fulfilment Level	Site functionality
n	353	353
R Square	0.547	0.445
F	141.097*	93.693*
Beta Level Unc.	0.666*	0.526*
Beta Mkt Unc.	0.120*	0.175*
Beta Org. Caps	0.028	0.079

* = p<0.005, ** = p<0.05

The analysis shows consistency over the metrics with the exception of market level uncertainty in fulfilment (less significant) and organisational capabilities in online sales (more significant). This analysis suggests that the uncertainty about the current level and market level are significant predictors for metric improvement uncertainty across metrics. Uncertainty about organisational capabilities to improve the metric is not generally significant.

Full interpretation of the data is not yet finished at the time of writing. At the conference we expect to present a more comprehensive analysis of the sample and to give a more complete interpretation of the data.

Instrument

Copies of the research instrument (in English and Dutch) are available from the author (hheijden@econ.vu.nl) upon request.

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