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# Lessons learned from analysing e-business progression using a stage model in Australian Small Medium Enterprises (SMEs)

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## Abstract

*This study examines the progression of e-business in eight small and medium enterprises (SMEs) using a stage model as a framework to explain the evolution of their e-business initiatives. In particular, the paper reports on the issues, barriers, and challenges that influence the progress of an e-business initiative. Most prominent are the issues of the perceived value of e-business, stewardship of e-business, and management commitment. We found that in order to gain a satisfactory pace of e-business progress, companies need to resolve these issues satisfactorily. Finally, using pragmatism as a theoretical lens through which to interpret the comments of the participants, it can be established that the stage model used in this study is an important guide to assist the management of SMEs to progress through with their e-business initiatives.*

## Keywords

Stages of growth, multiple case studies, small medium enterprises (SMEs), e-business

## INTRODUCTION

E-business offering opportunities and having great potential to provide competitive advantage by lowering cost, increase effectiveness, and increase cohesion between the company and its business partners. As an organisation enters the world of e-business, there are a range of issues to think through as well as the challenges and opportunities presented by e-business. More interestingly is how these challenges and perceived opportunities affect the progress of an organisation's e-business. With this in mind, a Stages of Growth for e-Business (SOGe) model was used as a template to assist in identifying and understanding the issues surrounding the e-business progression within a number of small medium enterprises (SMEs). In the sections that follow, we will outline the concept of stages of growth model, followed by the design of the research as well as our findings.

## THE STAGES OF GROWTH MODELS

The concept of stages approach in IS/IT can be traced back to the late 60s from the work of Churchill et. al. (1969) who postulated the concept of stages of computer development. However, the stages concept did not get wide exposure until Nolan proposed his "stage hypothesis" (Nolan 1973). Nolan's stages of growth model, which was later extended by Gibson and Nolan (1974), attempts to relate the transition of IT management processes to the maturity of IT. The stages hypothesis brought with it a lot of debate and attention from the practitioners and members of the academic community (Benbasat et al., 1984), much of it critical of both the

theoretical and empirical underpinnings (or lack thereof) of this concept. Regardless of the criticism of the stages theory in Information Systems (King and Kraemer, 1984 & 1987; and Benbasat et.al., 1984), the stages of growth model remains a popular framework for describing the typical development patterns of organisational information systems (Benbasat et.al., 1984; Saaksjarvi, 1985; King and Teo, 1997). Despite arguments being expressed both for and against the concept of stages, there have been comparatively few empirical studies into aspects of this theory, with typical conclusions drawn through arguing that the stages concept is useful in a pragmatic sense in that it appeals to managers. The authors' recent endeavour on the stages model and e-business found that the stages model is a useful framework to describe an organisation's current position as well as a range of possible position in the future in terms of their e-business maturity (Prananto et.al., 2003).

The emergence, rapid growth and interest in the Internet and e-commerce have seen the parallel development of a number of stages of growth models trying to capture and describe the various phases involved in moving towards greater sophistication with respect to the use and management of IT in the new E-business environment. Amongst these are the E-Commerce Maturity Model (KPMG, 1997), the Commitment-Implementation Matrix Model (Stroud, 1998), the E-Commerce Levels (O'Connor and Galvin, 1998), the E-Business Lifecycle Model (Berryman, 1999), the Internet Commerce Maturity Model (Poon, 1999b), Wheeler's evolution of net-enabled business innovation model (Wheeler, 2002), and stage of growth of e-commerce development for SMEs (Rao et.al., 2003).

All of these models are premised on the idea that organisations pass through notional 'stages' of maturity or sophistication with respect to the way they use and manage IS/IT to support and facilitate business activities, processes and operations. The work by Greiner (1972) and Quinn and Cameron (1983) indicates that there is a consistent pattern of development that seems to occur in organisations over time, in which the organisational activities and structures in one stage are not the same as the activities and structures present in another stage. Hence, the authors of the stages theory suggest that changes that occur in organisations follow a predictable pattern that can be characterised by developmental stages (Quinn and Cameron, 1983). These stages are sequential in nature, occur as a hierarchical progression that is not easily reversed, and involve a broad range of organisational activities and structures (Lavoie and Culbert, 1978). The progression through the stages can occur in rapid sequence or they can be very slow in developing (Cameron and Whetten, 1981). It is also suggested that there are inherent problems and issues in each developmental stage that the organisation needs to resolve before successfully advances to a more mature stage (Greiner, 1972).

## **STAGES OF GROWTH FOR E-BUSINESS (SOGE)**

In order to explain the progression of e-business in the context of Australian SMEs, we have developed a "Stages of Growth for e-Business" (SOGe) model. The original and provisional SOGe model (McKay et.al., 2000) was based on Galliers and Sutherland's stage model for IS/IT development (Galliers and Sutherland, 1994). However, after a rigorous testing, the model evolved to its current form (refer to Appendix A). As with all other stages of growth models, the SOGe model assumes that a normal progression is from a less mature to an increasing sophistication over time. Being at a more mature level assumes an accumulation of the knowledge, experience, skills and expertise of all the previous levels. The SOGe model retains the Galliers & Sutherlands (1994) notion that stages were both characterised as being comprised of multiple elements or characteristics, with an organisation being able to be at different levels of maturity on these different characteristics. It is conceivable that an organisation may be at Stages 3 or 4 with respect to its e-business systems, but may still be at Stage 2 (for example) with respect to its maturity in staffing/skills criterion (Prananto et.al., 2002). A summary of description of the SOGe model and its characteristics can be found in Appendix A

Our recent research suggests that the SOGe model is useful as a framework to help practitioners understand and describe the current state and position of an organisation with respect to e-business (Prananto et.al., 2003). Further, a clear understanding of the current position, together with the prescriptive value the model provides, can guide future planning and strategy formulation with respect to e-business initiatives. Thus the model could be viewed as a guide to understand, diagnose and evaluate the current position as well as providing insights and guidance on future progression and direction in e-business, including the realisation of potential business benefits.

Like the stage model developed by Galliers and Sutherland (1994 & 1999), the SOGe model acknowledges that organisations may "jump" over levels, and also recognises that extreme circumstances and failure may cause an organisation to regress to a less mature stage. The authors would assert however, that to be able to do this successfully, an organisation would have to possess (or have access to) the requisite skills, knowledge and experience needed to achieve such revolutionary transition.

## RESEARCH DESIGN

In order to achieve a deeper understanding of the variations in the progression of e-business and the applicability of the SOGe model to explain such progression, it was decided that interpretive case studies (Cavaye, 1996) would be conducted. The interpretive-qualitative case studies were seen as providing invaluable insights and in-depth understandings of the issues surrounding e-business progression and the applicability of a stage model given the limited number of (published) qualitative research in the subject of stages of growth model, as in the past, validation of stages concept were done mostly in a positivist-quantitative manner (refer to Lucas & Sutton, 1977; Drury, 1983; King & Teo, 1997; Teo & King, 1997). Although the focus of this paper is to report the result of multiple case studies, it is worth noting that the findings reported in this paper are a subset of a larger study utilising a multi-method research approach (the research started with a preliminary in-depth case study followed by a large-scale survey and eight case studies).

### Selection of Cases

The selection of the companies for the case studies was mainly based on the representativeness of the potential participant to the six stages of SOGe, in which, each stage of SOGe should have at least 1 corresponding organisation. Such a sampling method, referred to as theoretical sampling (Glaser & Strauss, 1967; and Eisenhardt, 1989), would allow the research to glimpse the unique characteristics of each company in each stage, as well as to observe the applicability of the model in organisations at different levels of IT maturity.

### Data Collection

The interviews were arranged after the key informant had been identified, usually the IS/IT manager of the organisation, with one exception in which the financial director was interviewed as the company does not have an IS manager. On one occasion the CEO of the company was interviewed in tandem with the IS manager as they were both involved directly in the e-business initiative.

The semi-structured interviews, comprised of a series of open-ended questions developed from the literature and issues/themes identified during the preliminary case-study and the survey, were divided into 2 sections. The first section was designed to gain insight on the current state and history of e-business within the company, future or planned initiatives, as well as various issues of interest (e.g. problems, barriers, outsourcing, etc.). At this stage, great care was taken not to reveal the concept of “stages”, limiting the possibility of leading and/or framing the informants’ mindset on stage-like development of e-business.

In the second part of the interview, informants were asked to examine the SOGe model depicting the description of the stages (refer to Appendix A) and to discuss the relevancy of the model in terms of their e-business experience. More importantly, the informants were asked to chart their planned e-business initiatives and to consider a plethora of issues such as barriers, challenges, benefits and resources needed to advance to the desired stage. It is important to emphasise that the informants were encouraged to express any concern, agreement and disagreement (even partial agreement and/or disagreement) with elements of the stages description.

The interviews were taped and then transcribed. The interview transcripts were returned to the participants for reviewing purposes and to ensure their accuracy and veracity (Klein & Myers, 1999). The eight organisations and their brief description can be found in table 1. The companies are listed as C1-C8 according to the order they were studied.

	C1	C2	C3	C4	C5	C6	C7	C8
Industry	Manufg & distribution	Freight forwarding	Retail	Engineering & calibration	Retail	Manufacturing	Manufacturing	Manufacturing
Established	1970	1987	1989	1973	1992	1978	1955	1960
Participant & years of service in current post	IT Manager (5 yrs)	Finance Director (6 yrs)	Business Director (14 yrs)	IT Mgr (10 yrs) CEO (25 yrs)	Business Director (11 yrs)	IT Manager (4 yrs)	IT Manager (20 yrs)	IT Manager (5 yrs)
Size	<100	<15	<30	<40	<20	<200	<150	~200
Q1 2002 stage	Stage 4	Stage 2	Stage 3	Stage 5-6	Stage 1	Stage 3	Stage 2	Stage 6 (IT) Stage 4 (Int. based e-business)
Planned stage	Stage 6, Q2 2003	Stage 5, >2005	Stage 5, Q4 2003	Stage 6, Q3 2002	-	Stage 5, Q2 2003 Stage 6, Q4 2004	Stage 6, >2005	Stage 6 (Int. based e-business), Q4 2003

**Table 1.** Company details

## Data Analysis

Content analysis was used to analyse the interview transcripts. The responses from the informants were categorised based on various themes and criteria, and then analysed using content analysis (Neuman, 1997). Some of the criteria and themes, as well as how the cases compared with each other, are presented in table 2.

	C1	C2	C3	C4	C5	C6	C7	C8
<b>IT/e-Business within the Organisation</b>								
Top management involvement in e-business is high	●	N	N	Y	N	N	Y	Y
Top management understand the value of IT and e-business	●	●	●	Y	N	●	Y	Y
IT has a good working relationship with the rest of the business	●	N	Y	Y	N	●	Y	Y
E-business planning session involve both business and IT people	Y	N	N	Y	N	N	Y	Y
Business and IS/IT/e-business plan are closely interconnected	Y	N	N	Y	N	N	Y	Y
IT manager is a member of senior management	Y	N/A	N/A	Y	N/A	N	Y	Y
IT & e-business are seen as having strategic value by the top management	Y	N	●	Y	N	●	Y	Y
IT & e-business are seen as providing business value by the top management	●	●	●	Y	N	●	Y	Y
IT & e-business are seen as providing competitive advantage by the top management	Y	N	N	Y	N	N	Y	Y
<b>Challenges and Barriers of e-Business Progression</b>								
Lack of commitment from top management	●	Y	●	N	Y	Y	N	N
Lack of clear vision and goal for e-business initiatives	N	Y	●	N	Y	●	N	N
No stewardship of e-business	N	Y	Y	N	Y	●	N	N
Limited resources	N	Y	Y	N	Y	Y	N	N
Lack of appropriate staff and skills	Y	Y	N	N	Y	●	●	N
Lack of perceived potential e-business benefits	N	●	N	N	Y	Y	N	N
Lack of know-how in integrating IT/e-business with business processes	N	Y	Y	N	Y	●	●	N
IT infrastructure does not support e-business initiatives	Y	Y	Y	N	Y	Y	●	N
<b>Outsourcing and External Consultant</b>								
Involvement of external consultant is crucial	Y	Y	Y	N	N/A	Y	Y	Y
<b>Perspective on SOGe and Stages-like progression</b>								
Progress in stages is preferable	Y	Y	Y	Y	N/A	Y	Y	Y
Provides guidance and a sense of direction	Y	Y	Y	Y	Y	Y	Y	Y
Reduced the complexity by having step-by-step approach	N	Y	Y	Y	N/A	Y	●	Y
A useful tool to raise strategic discussion on e-business initiatives	Y	Y	Y	Y	N/A	Y	Y	Y
SOGe provides a fairly accurate description on stages of e-business within the company	Y	●	Y	Y	●	Y	Y	Y

(● = partial agreement, N/A = Not Applicable)

**Table 2.** List of the themes used in analysing the qualitative data

## RESEARCH FINDINGS

### IT/e-business must deliver tangible business value

Responses from the participants of the study, as shown in table 3, strongly support the relationship between the progression of e-business initiatives with the perceived business value of e-business. Understandably, as noted by C1, a small and medium sized company with limited resources would want to get a faster turnaround of any investment it made. In most cases, the companies expressed the need to have noticeable short-term benefits.

Specific comments (refer to table 3) were made to emphasise the need to deliver tangible benefits from e-business initiative in order to persuade others to advance further to the next stage. Further analysis indicates that such sentiment derived from the need to convince management to commit the resources needed for further e-business initiatives. Arguably, the more attention and resources allocated by the management to the initiative the faster the progress would be.

When IT or e-business failed to deliver business value, scepticism of IT/e-business arose. Such scepticism increased the scrutiny of any IT or e-business investment in the future. In the case of C5, as the e-business initiative failed to deliver adequate sales, the business owner then decided to roll-back the initiative and not to engage in any further e-business related activity.

Company	Comments on business value
C1	“as a small company, we have limited budget and resources, we need to ensure we get value for every dollar we spend.” “There were several heads shaking at first, it was not until they were convinced that there would be benefits of the project in terms of greater exposure, more versatility in trading with overseas partners, and ability to trade through the e-trading facilities that they agreed.”
C3	“basically I want to see a direct result from what I put into my e-business, be it increased sales or [a] decrease in workload, whatever it is I need to be able to say to myself that [the] investment was not for nothing.”
C4	“the delivery of business value, added value, is absolutely important for this company. When we sit down to discuss our steps [of e-business initiatives] we weigh carefully the question of “what’s in it for the business?”.”
C5	“I had 4 inquiries from [the] online shop and 3 sales. The money for the internet connection alone was greater than the profit from those sales. There’s no benefit at all...”
C8	“...if the management have difficulties in seeing the potential benefits of e-business it’d be a different scenario altogether. [We] wouldn’t be going as fast as we are going right now.” “in most cases, they want to see the dollar value returned from their e-business investment. Some intangible benefits would be nice, but it’s the dollar sign that encouraged the initiatives in the first place.”

**Table 3.** Selected quotes on the need for business value

### Stewardship of e-business

The IT literature is filled with the importance of a project champion in ensuring the success of an IT initiative (Lederer and Mendelow, 1988; Beath, 1991). The findings of this research corroborate the need to have a strong leadership when it comes to advancing the organisational e-business initiative. In our sample, the IT manager was normally the person playing the role of the e-business champion often acting as a “sales person”, selling the e-business initiative idea to the rest of the organisation, above all to the top management. With regards to the eight cases involved in the study, a distinct line can be drawn to distinguish between those with top-management sponsorship of e-business and those who do not, with high level patronage being associated with a relatively more rapid progression of e-business initiatives. Comments supporting this notion were captured in table 4.

Company	Comments on e-business champion
C1	“oh it took several meetings and presentations to convince the management of the viability of this [e-business] project... So there was definitely a selling component of this job, to convince management that this is important for the company.”
C4	“we were very fortunate that the CEO believes in IT and is reasonably tech savvy, without his patronage we would not go this far.”
C7	“there were some selling [of the e-business initiative] at the beginning, but we didn’t have much choice really. Our system was becoming less and less able to handle business requirements... We’ve had to replace our current systems. It is not a matter of whether we want to or not, but we must... the system is no longer able to cater for the fast-changing needs of the company... I did several rounds of meetings with the business unit leaders, getting their requirements, putting forward proposals of what the new system would be like etc., but was basically selling the e-business idea.”

**Table 4.** Selected quotes on e-business champion

### Challenges and barriers in advancing to the next stage

The three most prevalent challenges & barriers that emerged throughout of the cases were the issues of cost, skills/staff, and building the required IT infrastructure. These issues are prevalent in companies with low-medium IT/e-business maturity. A range of comments from the participants regarding these issues can be found in table 5.

Agreement was found across the cases of the need to resolve certain issues/problems before they could advance further with their e-business initiative. For example, C6 indicated that the only way they could progress further with any e-business project was by convincing the management of the importance and value of IS/IT. Similar sentiments (refer to table 5) were expressed by C1 and C5. C5, in particular, strongly articulated the need to have a guarantee that value would be delivered from e-business before the management would commit to any e-business project. Such commitment from top management would ensure the financial and human resources needed to build an adequate IT infrastructure to enable the implementation of e-business projects.

Company	Comments on barriers of e-business progression
C1	“there’s definitely a commitment issues indicated by the top management and reluctance from the marketing/sales people in adopting the e-business system. So it’s important to break this barrier by showing them the proof of the benefits of e-business before we move on to the next stage”
C3	“Our progress [in terms of e-business] has been modest at best, we simply do not have the skills needed, while having a consultant to come in and do the job properly is quite costly.”
C5	“I won’t do anything unless there’s a guarantee that it will be successful and I will be able to recoup any investment I put in.”
C6	“The [management] confidence in IT was 0. IT department in this company had been long regarded as a cost centre, mainly for providing help desk support. There was a great interest during the hype of e-commerce, but after faced with the cost of building the IT infrastructure to enable e-business, the management backed-off.” “we are currently trying to build awareness and confidence of IT. This is the only way we can move forward with our e-business. If we can show the management that IT is providing a good, reliable and timely services and initiatives, they might change their view on IT and give us a go with our e-business initiative.”

**Table 5.** Selected quotes on barriers of e-business progression

### Outsourcing vendors and external consultants

SMEs in this study were primarily motivated to involve outsourcing vendors. Experience and expertise in designing and implementing e-business are being regarded as the top reason of involving an outsourcing vendor or consultant. With limited resources (i.e. staff and skills), a small and medium company has little choice but to outsource its e-business development and implementation to an external entity. The involvement of such an entity potentially accelerates the progress of e-business implementation within a company. On the other hand, the inclusion of outsourcing vendors and external consultants might add further complexity in an e-business initiative.

In situations where an outsourcing vendor is involved, good contract management is deemed to be essential. Knowledge in contract management and negotiation was deemed to be essential. This was emphasised by the case of C7 (refer to table 6), who was approached by the outsourcing vendor “equipped” with a “standard” outsourcing contract favouring the vendor.

Company	Comments on outsourcing vendors and consultants
C1	“we have to [use external consultant], as a small company we don’t have the manpower to develop our software in-house. The obvious was to get a consultant in to develop the system based on our requirement”
C3	“they simply have the expertise in designing such system that we don’t”
C7	“... we’ve gone to a bit of trouble to make sure we are protected in the contract. The original contract was very much weighted in their favour.” “...not only the issue of us being protected, but also to guarantee that they deliver the goods as promised in a timely manner. We are a small company, we don’t have the in-house capability to quickly fix problems that arise from a faulty system or its implementation, nor do we want a long legal battle, if it ever comes, to determine what’s in the contract. We had to be very thorough and clear of what their responsibilities are, milestones, what happen if something goes awry, penalty and so on...”
C8	“past experience indicates that although they can speed-up the system implementation process, as opposed to us doing it ourselves, it is not the same case as the process of integrating it to our business processes. It is still an issue that we have to deal with after the implementation.”

**Table 6.** Selected quotes on outsourcing vendors and consultants

### Revolution as a fast-paced evolution

The perception of linearity of a stages model is commonly cited as a source of criticism in the literature involving a stage model. Although the research does not prescribe to such notion of a strictly step-by-step linear progression, it acknowledges the stages as a central tendency (Drury, 1983; and Benbasat et al., 1984) in explaining e-business progression. Some of the comments from the respondents (refer to table 7), suggested that the notion of a ‘revolutionary’ progression could be described as a very fast progression.

Company	Comments on outsourcing vendors and consultants
C1	“...it’s fast and very straightforward progression” “...we are moving rapidly, very rapidly from the past 8-10 months from having almost nothing, to what we have currently” “Revolutionary? Not quite, it’s not very complex, so we can fast-track it a bit more”
C4	“...the progress perhaps is not revolutionary, at least not in my opinion. It depends on what you call revolution. We did progress really really fast, but it really is based on continuity of development phases”
C7	“...well I’d like to think of it as revolutionary, for this company anyway. Imagine from no e-business capability to a fully capable e-business functions and operations within less than 2 years time, but I can see that if we break it down I can see that what we are actually moving at a very fast rate, not revolutionary in that regard, but a fast progression. And we have to sort of go through all these steps, we can’t have fully automated link to our suppliers and clients without integration, wouldn’t be able to, without reengineering business processes and so on”

**Table 7.** Selected quotes on evolutionary vs. revolutionary progression

### Applicability of the SOGe model

The case studies revealed that the stage model and its characteristics provide an accurate description of a development and progression path for an organisations’ e-business initiatives. More importantly, the participants in the case studies seemed to be able to conceptualise their organisation’s e-business progression in a stage-like development. Further, as indicated by the responses captured in table 8, the respondents regarded the stages approach as useful in explaining their past, current, and likely future involvement in e-business, suggesting that the stages model has a pragmatic value in assisting the management of an organisation in assessing and evaluating their current position with regards to their e-business initiatives, as well as helping them to plan their future involvement in e-business. Arguably, this may indicate that the SOGe model can be used as one of many tools in the formulation of e-business strategy.

An interesting comment was made by C4, who regarded their progression as “continuous” rather than in stages. However, the IS/IT manager and the CEO of the company, acknowledged the accuracy of the model’s stages

description and were able to chart their progression with regards to their IS/IT and e-business initiatives from the mid 1980s to 2002.

Company	Comments on SOGe applicability
C1	“Looking back, they were at stage 2... quite obvious when they jumped to e-marketplace without proper infrastructure and preparation. From then onwards we moved to stage 3... I can see that we are at stage 4 now, but we are moving towards stage 5 which is the integration of our systems, the new front-end and our current back-end systems, with our business processes... so we are moving rapidly, very rapidly from the past 8-10 months from having almost nothing, to what we have currently. ... Stage 6 is what I told you earlier, with the initiatives to link our systems with our trading partners, but it’s a long term thing, that will involve a major consideration and us sitting together with our partners to smooth things out”.
C4	“... although I didn’t see our movement as in distinct stages, but rather a continuous progression, I can see that this describes our situation accurately. Prior to this, we did have a fully integrated environment, in which our (latest) initiatives wouldn’t take off without it... I can see that according to this diagram, we have progressed from stage 5 to stage 6 even if we didn’t plan it in stages.”
C6	“... I found it helpful to progress in such (stages like) manner, it allows me to concentrate and focus on a specific task at one time. It is also easier to deal with the management as I can go to them at the end of each phase and tell them what I’ve done. When you are dealing with somebody who is uncertain about the role of IT but hold the key to the vault, it is easier to go step by step to convince them.” “going to stage 6 will be our main goal, strategic and long term... it will be beneficial for us, but we have to go a long way before implementing such [system], as rightly shown in the diagram... to do it properly we have to consolidate all our systems, manufacturing systems etc, other processes before we can connect to our suppliers/customers..”
C7	“this diagram is quite accurate, yeah... I can see what we are doing. Although probably we are not moving all together in these strategy, staff, etc, but we will reach the end state...” “This diagram, shows what we are doing, we want to be here (stage 6), streamlining our business with our partners business. We know it’s not easy, we need to streamline our internal (processes) before trying to connect to our clients.” “...usable, possibly as a point of discussion... guidelines or some sort. Quite simple to understand, you can easily pinpoint the state of the company, the goal, and trace the next thing to do.”
C8	“facilitate discussion between the IS/IT people and the management, as it also discusses about strategy, staff, and impact on the business processes, and not just looking at the development solely on the technology – IT perspective, but rather on a wider, organisational, perspective”.

**Table 8.** Selected quotes on SOGe applicability

## CONCLUSION

The paper highlighted the varying pace of e-business progress in eight organisations. Our study revealed that such variation might be caused by the ability of each company in facing and resolving the challenges and barriers in planning and implementing e-business. The lesson learned from the cases, in which the organisations experienced a rapid e-business progression, suggests that it would be wise for an organisation to address these challenges and barriers sufficiently before it progresses further.

The research in general, has attempted to bring the stages of growth model beyond the academic domain into a more pragmatic application by having our industry-representative participants use the model in assessing their e-business progression and in anticipating their long-term e-business initiatives. Throughout our cases, we found that the SOGe model is able to capture the subtle nuances of the e-business within the organisations. More significantly is the favourable responses from the participants when using the model to explain their e-business evolution as well as the benefits and challenges associated with it. This suggests that the model has a pragmatic value, especially as a tool to provide guidance and to generate discussion when planning for e-business.

## REFERENCES

- Beath, C. M. (1991). "Supporting the Information Technology Champion." MIS Quarterly **15**(3): 355-372.
- Benbasat, I., A. S. Dexter, et al. (1980). "Impact of organisational maturity on information system skill needs." MIS Quarterly **4**(1): 21-34.
- Berryman, E. (1999). Getting on with the business of e-business, PriceWaterhouseCoopers.
- Cameron, K. S. and D. A. Whetten (1981). "Perceptions of organisational effectiveness over organisational life cycles." Administrative Science Quarterly **26**(4): 525-544.
- Cavaye, A. L. M. (1996). "Case study research: A multi-faceted research approach for IS." Information Systems Journal **6**: 227-242.
- Churchill, N. C., J. H. Kempster, et al. (1969). Computer based information systems for management: A survey. New York, National Association of Accountants.
- Drury, D. H. (1983). "An empirical assessment of the stages of DP growth." MIS Quarterly **7**(2): 59-70.
- Earl, M. J. (2000). "Evolving the e-business." Business Strategy Review **11**(2): 33-38.
- Eisenhardt, K. M. (1989). "Building theories from case study research." Academy of Management Review **14**(4): 532-550.
- Galliers, R. D. and A. R. Sutherland (1994). Information systems management and strategy formulation: Applying and extending the 'stages of growth' concept. Strategic Information Management: Challenges and Strategies in Managing Information Systems. R. D. Galliers and B. S. H. Baker. Oxford, Butterworth-Heinemann Ltd: 91-117.
- Galliers, R. D. and A. R. Sutherland (1999). The evolving information systems strategy: Information systems management and strategy formulation: applying and extending the 'stages of growth' concept. Strategic Information Management: Challenges and Strategies in Managing Information Systems (2nd Ed.). R. D. Galliers, D. E. Leidner and B. S. H. Baker. Oxford, Butterworth Heinemann: 31-60.
- Gibson, C. F. and R. L. Nolan (1974). "Managing the four stages of EDP growth." Harvard Business Review **52**(1): 76-88.
- Glaser, B. and A. Strauss (1967). The discovery of grounded theory: Strategies of qualitative research. London, Wiedenfeld and Nicholson.
- Greiner, L. E. (1972). "Evolution and revolution as organisations grow." Harvard Business Review **50**(4): 37-46.
- King, J. L. and K. L. Kraemer (1984). "Evolution and organisational information systems: An assessment of Nolan's stage model." Communications of the ACM **27**(5): 466-485.
- King, J. L. and K. L. Kraemer (1987). Evolution and organisational information systems: An assessment of Nolan's stage model. Towards strategic information systems. E. K. Somogyi and R. D. Galliers. Cambridge, USA, Abacus Press: 127-144.
- King, W. R. and T. S. H. Teo (1997). "Integration between business planning and information systems planning: Validating a stage hypothesis." Decision Sciences **28**(2).
- Klein, H. K. and M. D. Myers (1999). "A set of principles for conducting and evaluating interpretive field studies in information systems." MIS Quarterly **23**(1): 67-94.
- KPMG (1997). Electronic commerce research report 1997. London, UK., KPMG Management Consulting.
- Lavoie, D. and S. A. Culbert (1978). "Stages of organisation and development." Human Relations **31**(5): 417-438.
- Lederer, A. L. and A. L. Mendelow (1988). "Convincing top management of the strategic potential of information systems." MIS Quarterly **12**(4): 525-534.
- Lucas, H. C. and J. A. Sutton (1977). "The stage hypothesis and the s-curve: Some contradictory evidence." Communications of the ACM **20**(4): 254-260.
- McKay, J., Prananto, A., & Marshall, P. (2000). E-business maturity: The SOG-e model. Proceedings of the 11th Australasian Conference on Information Systems (ACIS), 6-8 Dec, Queensland University of Technology, Brisbane, Australia.

- Neuman, W. L. (1997). Social research methods: Qualitative and quantitative approaches. Boston, USA, Allyn and Bacon.
- Nolan, R. L. (1973). "Managing the computer resource: A stage hypothesis." Communications of the ACM **16**(7): 399-550.
- O'Connor, J. and E. Galvin (1998). Creating Value through E-commerce. London, Financial Times, Pitman Publishing.
- Poon, S. (1999). Small business and internet commerce: What are the lessons learned? Doing business on the internet: Opportunities and pitfalls. F. Sudweeks and C. T. Romm. London, UK., Springer: 113-124.
- Prananto, A., Marshall, P., & McKay, J. (2002). Stages of growth of e-business: An analysis of the perceived usability of the stages of growth model in e-business progression. 4th International Conference on Electronic Commerce (ICEC), 23-25 Oct, City University of Hong Kong, Hong Kong SAR, China.
- Prananto, A., McKay, J., & Marshall, P. (2003). The spectrum of e-business maturity in Australian SMEs: A multiple case study approach to the applicability of the stages of growth for e-business model. 11th European Conference on Information Systems (ECIS) 2003, Universita di Napoli Federico II, Napoli, Italy.
- Quinn, R. E. and K. Cameron (1983). "Organisational life cycles and shifting criteria of effectiveness: Some preliminary evidence." Management Science **29**(1): 33-51.
- Rao, S.S., Metts, G., and Monge, C.A.M. (2003). Electronic commerce development in small and medium sized enterprises: A stage model and its implications. Business Process Management, **9**(1), 11-13.
- Saaksjarvi, M. (1985). "End-user participation and the evolution of organisational information systems: An empirical assessment of nolan's stage model." Communications of the ACM: 181-189.
- Stroud, D. (1998). Internet strategies: A corporate guide to exploiting the internet. London, Macmillan Press Ltd.
- Teo, T. S. H. and W. R. King (1997). "Integration between business planning and information systems planning: An evolutionary-contingency perspective." Journal of Management Information Systems **14**(1): 185-214.
- Wheeler, B.C. (2002). NEBIC: A dynamic capabilities theory for assessing net-enablement. Information Systems Research, **13**(2), 125-146.

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## APPENDIX A.

### Description of the Characteristics of the SOG-e Model

Stage	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
<b>Strategy</b>	No strategy and planning for e-business development and implementation	Ad hoc strategy. No formal strategy, but there is some sense of direction for e-business initiatives	There is a formal strategy for e-business initiatives with a technology-centric or no consideration for business strategy	E-business initiatives and activities support the achievement of business goals. There are attempts to integrate and coordinate e-business initiatives with business strategy	Strategy is regularly reviewed and updated. Strategy review sessions involve participation and input from IS/IT and business people, e-business initiatives are influenced by business needs. Strategy for e-business may aim to seek and evaluate new opportunities to provide strategic value for the business	Constant and dynamic strategy and planning sessions that includes both IS/IT and business people. On-going strategic conversation within the organisation and externally with suppliers and business partners to use e-business initiatives as a source of competitive advantage
<b>Systems</b>	Uncoordinated and unconnected systems with limited applications	Increasing use of IS/IT in many aspects of the business, but little input from business strategy in making IS/IT investments	Greater infusion and diffusion of IS/IT with some input from business strategy	Greater inputs from business strategy, but still some IT-driven investments	Systems are focused on internal organisational activities to provide added value to business activities. IS/IT systems are highly integrated with various parts of the organisation which results in a seamless information exchange within the organisation	Systems are focused on seamless interorganisational activities. Corporate systems are highly integrated internally as well as externally, reaching out to business partners' corporate systems
<b>Staffs/ Skills</b>	No formally appointed staff to handle e-business initiatives	Designated staff with expanded responsibility to develop and maintain e-business initiatives	Dedicated staff with technical expertise but without sufficient business knowledge	Dedicated staff with technical expertise with the help of, or together with, business-oriented staff	A team of staff from different departments of the organisation manage the e-business initiatives. A steering committee may be formed to oversee the development of e-business initiatives	Management is committed to an e-business vision and involved in its implementation. The organisation has access to all requisite skills and knowledge for the e-business initiatives
<b>Bus Proc</b>	E-business initiatives are seen as having no impact on existing business processes. Traditional business processes are unaffected by e-business initiatives	E-business initiatives are seen as having little impact on existing business processes	E-business initiatives are seen as having considerable impact on existing business processes and may require process changes	E-business initiatives are seen as a driver of business process reengineering. Reengineering of business processes to accommodate the integration of between IS/IT, Internet based systems, and various parts of the organisation	E-business initiatives play a vital role in streamlining the organisation's internal operations and reorganising of business functions to shorten process cycle time and deliver value to customers	E-business initiatives play a vital role in restructuring the processes linking external business network members to accommodate interorganisational systems. Integration of the e-business initiative and business processes between the organisation's and its business partners