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SMEs and Internet Adoption Strategy: Who Do SMEs Listen To?

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Abstract

Governments have developed policies and strategies which are designed to assist SMEs to become e-enabled. It is not clear what impact these strategies have on SMEs. There is some evidence that customers drive adoption due to the need to integrate information in the supply chain. There is also some evidence that owners of SMEs drive forward adoption, primarily because of the perceived benefits.

The paper uses network actor theory to investigate these issues. Five influence networks are identified. These are the expert network, primarily IT firms; the industry led network, SMEs working in collaboration with industry organisations; the customer led network, driven by customer requirements. The drivers of these networks are primarily strategic. The final two networks are the ICT support network and novice networks which are driven by the SME owner. The key difference is less developed internal IT.

The main outcome from the analysis is that government policies and strategies have no influence on adoption. The second outcome is that competitor pressure has no influence. The research supports the contention that customer pressure is central. Additionally, IT suppliers have a key influencing role. The implications for government are explored.

Keywords: internet adoption strategy, government policy, SMEs

1 INTRODUCTION

This paper considers Internet adoption strategy in SMEs from the perspective of who drives it. There is considerable effort being expended, both in time and money, by governments in encouraging small and medium sized enterprises to invest in internet technologies. It is not clear that this effort is having the desired effect on SME internet adoption. This paper reviews the benefits of the Internet as they are understood by SMEs. The development of Internet adoption strategies in SMEs are considered from the perspective of who is instrumental in the decision process. The paper reflects on the role of government in encouraging Internet adoption.

The paper uses network actor theory to assess the process by which SMEs consider adopting the Internet, by considering the different players in the process. The CW2000 project, a European funded project to encourage Internet adoption amongst SMEs in the West Midlands of the UK is used to identify adoption patterns. Fifty case studies of companies participating in the project were undertaken over a three year period. The companies were all visited at least twice. Five patterns of Internet adoption strategy are identified. Exemplar case studies are presented. Conclusions are drawn that suggest that as with other ICT decisions the owner is key. However, there is some evidence that local project support and suppliers are more instrumental in adoption strategies than direct government intervention. Future research is identified.

2 INTERNET ADOPTION AND SMES

Currently SMEs are generally unwilling to develop e-commerce systems or to change current business models (Keindl 2000). Recent research suggests that SMEs are unlikely to follow a stages model. Rather, they focus on what is best to meet the owners' strategy for business growth. Internet development in SMEs is likely to be slow to reflect this approach to resource investment. Figure 1 demonstrates the different adoption patterns. These are based on the owner's recognition of the business value of the Internet and their approach to planning business growth. The "not planned" growth dimension represents the lack of a coherent strategy for growth. Competitive pressure is usually determined by customer demands.

	High	*Business Opportunity* Some perceived benefits Owner has knowledge of IT Some competitive pressure	*Business Network* High perceived benefits Good Knowledge of IT opportunities High competitive pressure
Business Value of the Internet	Low	No perceived benefit Little or no knowledge of IT value to the business No competitive pressure *Brochureware*	Some perceived benefits Owner has knowledge of IT No Competitive pressure *Business Support*
		Not Planned	**Planned**
		Business Growth	

Figure 1: Segmented Internet adoption patterns in SMEs (Levy and Powell 2003)

Previous research finds that SMEs adoption of ICT does develop - changes in ICT adoption are made as the strategic focus of the business changes. Growth requires improved systems (Levy et al 2002). It is likely that the situation with Internet technologies will be similar. Steady growth is not the path

adopted, rather SME owners focus on the best potential of technology for their business. They are likely to make step changes to support business strategy.

2.1   Drivers for Internet Adoption in SMEs

Mehrtens et al (2001) suggest three drivers of SMEs' decisions to invest in e-business - perceived benefits, organisational readiness and external pressures. There are three aspects to perceived benefit. First, efficiency benefits arise from improved communication using e-mail (c.f. Poon 2000). In common with most large businesses, SMEs have embraced e-mail (Poon and Swatman 1999), with 90% of SMEs using it regularly after its introduction (Chapman et al 2000). Second, effectiveness benefits obtain from the ability to gather research and competitor information. Third, the Internet presents a modern image and improves SME promotion. Identifying new business opportunities is also a perceived benefit (Chapman et al, 2000).

Organisational readiness for Internet adoption is personified in the SME owner. SMEs do not see Internet adoption as an IT issue, but as a business one. SMEs that are attracted to Internet commerce tend to be more entrepreneurial, risk takers, innovative and, invariably, creative (Poon and Swatman 1999). A second organisational readiness factor is the requirement for SMEs to have adequate IS to access the Internet. However, the time spent on Internet adoption and development may interfere with the core business activity (Poon and Swatman 1999).

Most SMEs do not view the Internet as key to their business strategy. Strategy is rarely raised as an enabler or as an inhibitor in the literature. The owner is critical in determining Internet development (Levy and Powell 2002). However, strategic commitment has been shown to be critical in Singaporean SMEs (Kowtha and Choon 2001). Indeed, Internet adoption is faster when SMEs recognise a business need (Kendall et al 2001).

The final factor, external pressure, is primarily from customers, though suppliers and employees exert influence. This might lead us to question whether there might be sectoral differences in adoption given varying external conditions that impact different industries. While Poon (2000) recognizes customer pressure as influential, a lack of customer use is an inhibitor, particularly of e-mail (Sillence 1998). However, few SMEs integrate their websites with their back-office systems. While many see value in e-mail there is scant evidence of decisions to invest in internal networks or e-business systems (Keindl 2000).

While customer push is influencing SMEs adoption of the Internet, moving to e-commerce requires more consideration. Many SMEs have invested heavily in EDI and their current dilemma is whether to fulfil customer demands to move to Internet-based e-commerce systems. This is particularly seen among those SMEs that are preferred suppliers i.e. adoption is a function of business relationships and networks (Poon 2000). However, EDI is the mandated means of order processing by many major SME customers, particularly in UK manufacturing (Levy and Powell 1998).

Overall, perceived benefit is the main driver for Internet adoption with some evidence of external pressure, particularly for those SMEs with close relationships with their customers. Internet use amongst SMEs may take many forms, from simply using the web to purchase supplies to developing a web site to sell products and services. Organisational readiness for Internet adoption is also an important issue.

2.2   The influence of government policies on SME Internet adoption

Governments in the European Union and SE Asia among others have defined active intervention policies to encourage SMEs to adopt the Internet. In the UK the government has developed policy guidelines and web sites that provide information about the opportunities from the Internet. Government business advisors encourage SMEs to take their first steps to Internet use. The European Community provides funds for projects that support advice and training for SMEs (Lunati 2000). In

Singapore the there are a number of initiatives to work with SMEs (Kendall et al 2001). Similarly in Korea, government policy has been at supporting SMEs (Nugent and Yhee 2002). However there is little evidence that these policies are particularly successful in changing attitudes amongst SMEs. In Singapore it is the existing knowledge of the owner and the relative advantage from e-business that drives adoption (Kendall 2001). While in Korea, advice from commercial sources is valued more highly than that of government support (Nugent and Yhee 2002).

2.3   Summary

The literature suggests that SMEs decisions to adopt the Internet are more dependent upon the relative advantage an indirect benefits they might obtain. Government pull is not likely to be a factor, indeed it is likely to be rejected. The SMEs themselves are often the driver of change with the owner being the predominant force. The external pressure when it comes is likely to be from customers. The research in this paper thus is to explore more the nature of the drivers of change by considering both internal and external drivers.

3   RESEARCH METHOD

Network actor theory is a very useful means of exploring the patterns of interaction within and between organisations (Conway 1997). Network analysis focuses on the configuration, nature and content of the set of internal and/or external organisational relationships. Conway (1997) integrates different disciplinary network perspectives (including Laumann, 1983; Mitchell, 1969; Tichy,1979; and Scott, 1991) and develops a set of representations to analyse the complete set of relationships (also see Mody, 1990).

The network literature identifies the key elements of the network to be the actors, links and flows. Conway (1997) develops what he calls Focal Innovation Action-Sets which examine individual actors involved in a specific innovation. Central to the framework is the examination of the sets of relationships involved in the innovation. Relationship variables fall into six categories: Relationship type (operationalised, social, and moral) (see Kanter, 1972); Formalisation (extent of formal recognition); Intensity (strength and frequency of interaction and flow of transaction content over time); Reciprocity (balance and flow over time of transaction content unilateral or bilateral); Multiplexity (the degree to which two actors are linked by multiple role relations (Tichy, 1979; Conway, 1997)); and the origin of the link..

Conway (1997) identifies six zones that embrace the external environment of the firm (area outside the ellipse). While Conway's framework focuses on the external relationships Beckinsale and Jones (1999) recognize that the internal relationships within an organization may have some influence. They consider that the internal strategic cohesion of a firm may be an influencing factor (Dodgson and Rothwell 1991). Thus the Conway (1997) framework is expanded to provide the full picture of the internal and external sets of relationships. Figure 2 shows the template incorporating the internal elements of the organisation.
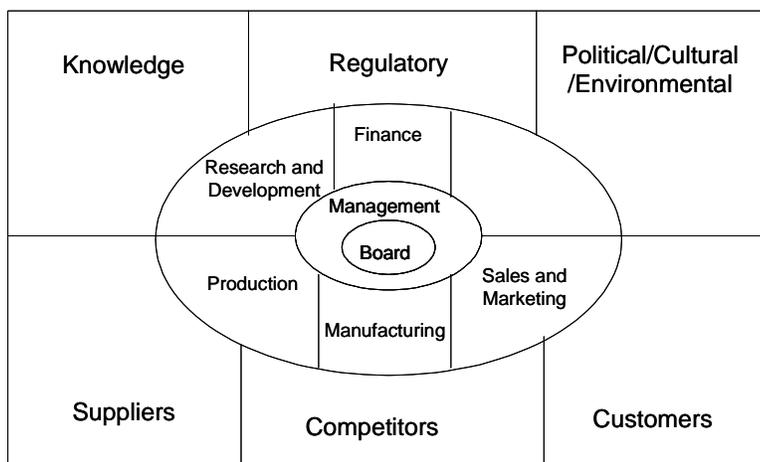
Figure 2: Network Actor Framework (adapted from Beckinsale and Jones 1997)

This framework provides a stronger network detail and graphical representation of: the internal relationship; internal to external relationship; the intensity of relationship; the flow of relationship; and therefore within the innovation network an overall relationship representation. The central segments represent the internal organisation of the firm, are positioned in relation to the external segments (see Daft, 1992, p.81) and hence can graphically show the functions to which the actors are attached; map the internal links; map internal actors with other internal actors as well as external relationships; and analyse the networks strategic links. Therefore the template can be used to map and then examine the relationships by which SMEs consider Internet adoption.

3.1   Data Collection

The CW2000 project is a major European regional development fund project in the West Midlands of the UK. The West Midlands is an Objective 2 region in the European Community which is looking to move its dependence from the declining automotive industry. The aim of the CW2000 project was to help 600 SMEs gain Internet facilities and access to Internet services.

To determine the key influences on decisions to adopt the Internet this research undertook 50 case studies of SMEs in the project.   There was no attempt to specify the sample as Levy and Powell (1999) have shown that strategic ICT decisions are not influenced by industry. Pragmatically, the CW2000 project was developing over time, with the majority of SMEs joining later in the project. It was important for this research to monitor the process over time, hence most of the case study companies are early adopters. While this might be expected to bias the results optimistically, this has not proved to be the case when compared to the later participants.

Interviews were held with owners and senior managers in the SMEs to identify their reasons for deciding to undertake Internet adoption. The interviews considered the strategy of the business and the influencing factors in the decision process. Actor networks were developed. The findings were confirmed with the companies. The assignation of the SMEs to the different network categories was carried out by each author separately. After discussion a final assignation was determined.

4   ANALYSIS

4.1   Instrumental Relationships for Joining CW2000

The 50 case studies demonstrate five patterns that identify the relationships that are instrumental in determining whether SMEs join CW2000 (see Table 3). Five cases are presented as exemplars. The cases are modelled using the network agency framework to highlight the role of internal or external relationships in determining whether to subscribe to CW2000. These relationships are seen in the light of the person driving development, this is either the MD, in smaller SMEs or the IT director in larger SMEs with an IT department. The network diagrams below only show relationships with customers or suppliers that are influenced by or influence the development of web and related technologies

Network	No of Cases	Relationship Issues
Expert	16	Customer partnership Development completely in house – except maybe the first web site although unusual Internet development and the network shape geared towards providing a service for existing or new customers. No influence from government, regulatory bodies, competitors or external support agencies MD led
Industry Support	5	Network has the greatest number of external links either influencing or assisting in the development Regulatory influences are high External knowledge vital Greater e-Commerce development Internal linkages increase to manage development MD led IT director driven No influence from government or competitors
Customer Led	12	External influence key – customers are drivers to development Internal linkages increase to manage development MD led IT director driven No influence from government, regulatory bodies, suppliers or competitors
ICT Support	11	Network development internally formalized this appears to fit with the internet development for internal use and communication as the main driver. Limited opportunities to use email with suppliers MD led No influence from government, regulatory bodies, support agencies or competitors
Novice	6	Networks very limited New to the technology Very unsure of use Limited opportunities if any so network links are few. MD led No influence from government, regulatory bodies, competitors or external support agencies

Table 1: Relationship Networks in CW2000

The first three relationships suggest that the companies have all developed IT internally to some degree. The decision to join CW2000 is based on a business requirement to develop and grow the business. There are three models of relationship development here. The first is the expert network, which is primarily evidenced by the IT companies. The second is the industry support network, where

companies are working in partnership with industry organisations. The third group is the customer led network, where customer pressure is seen to be instrumental in the decision to invest in Internet technologies. The last two relationships are primarily found in organisations with either limited ICT use or with an internal focus. The fourth network is the ICT support network, where companies have developed internal support systems and are investigating whether there are opportunities to be more customer focused. The final network, the novice network, is primarily those companies that have little knowledge or experience of the value of ICT to their business.

4.1.1　　Expert Network

Online Education started in 1998 with funding from a university enterprise scheme. It is owned by the managing director. The objectives of the firm are to provide on-line education services ranging from authoring, consultancy, technology and internet development services. The firm employs six highly skilled internet development staff. All have strong understanding of the technology and how it may be used and designed. All were hired on the basis of this knowledge. The development of the company's web site is based on customer requirements through consultation sessions with clients. The main customers for the firm are universities and colleges. An issue for the firm is that 40% of their business is with one customer. The firm is depending on the internet for delivery and interaction with customers. For them fast access to the internet is vital, the main reason for the firm's involvement with CW2000 was to gain access to ADSL at a relatively low price.

The owner of the firm is instrumental in decisions regarding internet adoption issues. The relationships are between the owner and external players. The customer is the key actor in the relationship. The design of the online learning and delivery of product is determined by the customer requirements. This appears to be the case with many of the IT sector based companies. CW2000 is seen in the context of this case as a supplier. The information available to the firm from CW2000 through the Project Director has been influential in supporting the company and in providing information about the ADSL service.

4.1.2　　Industry Support Network

Hair Products was started in the 1930s as a wholesale trade company to supply barbers and ladies hair salons. This is still the major part of the business. The firm employs 80 people and has a turnover of £7.5m. The firm has markets throughout the world. It sells through a variety of outlets including mail order, and trade centres. The biggest growth area for the firm is in the beauty side of the business due to the increasing exploitation by salons of treatments and therapies. The firm is supplying 65% of the beauty salon and hotel sector with beauty products. The firm is working closely with the industry regulatory body to develop e-commerce services for beauty products to sell directly to the public. The site also aims to develop the industry. One approach to do this is to provide a salon finder service on the web site as well as links to different product suppliers. As a larger SME, Hair Products has an IT department with an IT director and 3 IT staff members. Both the CEO and the IT director believe the "*technology can drive the business*" and "*aid growth and turnover*". While the owner is central to the decision to work with the industry body, the IT department is leading on the web site development. The firm's contact with CW2000 was to find out more about web development opportunities. The firm value the impartial advice that they are offered.

The owner is again critical to the decision to progress internet development. However in this case the IT Director is instrumental in coordinating IT and Internet development within the organisation. There are more external links than in the other cases due to the development of the eCommerce web site with the Beauty Industry Guild. An interesting link is with the company in the knowledge segment of the map. This company is currently assisting in providing information on competitors and their web development plus examining existing web sites. It was through this external knowledge link that Hair Products heard about CW2000.

4.1.3   Customer-Led Network

Agricultural Engineering was established in 1969 to supply the agricultural industry with machine, press work and castings for relevant machines. The company employs 150 people. The firm is planning to expand and employ a further 20 people in the near future. The chairman of the firm is the owner. There is a managing director and four additional directors who oversee works, technical, commercial and general operations. The firm's main customer accounts for 35% of all sales. Turnover is about £8m. The firm also has a strategy of growth through acquisition. IT has not been a major element of the firm's business. However, training in the use of IT has been considered important. This has been led by the managing director. A recent takeover however brought a number of IT staff with it. There is now a formal IT department in the firm. The acquisition has changed the nature of the firm's business providing an entry into the telecommunications market.

The company is in close discussions with customers on the development of customer focused web processes. Much of this is happening via e-mail. As a manufacturer and supplier to automotive firms it had seen change in customers' use of the Internet. Customers such as Massey Ferguson and Saab Scania are driving Internet adoption and the move to limited integration with back-office systems. These customers are pushing to move away from paper communication and utilise e-mail and web sites to communicate job status and assist Kan Ban manufacturing processes in real time. Customers are now demanding e-mail contact with the firm as well as providing information of order progress through the web site. The firm sees the use of the Internet becoming more important as the telecommunication business grows. Internal departments are linked through an Intranet. While the MD is central to strategic decision making the IT department is working closely with customers to identify requirements. The firm became involved with CW2000 when ADSL provision was identified as important for speed of information transfer. The information about the possibility of having ADSL was identified by the consultant who was working closely with the firm.

These three networks all demonstrate the value of external relationships external relationships to the development of web-based business and ultimately commerce. The expert network and industry network are working in partnership with customers and industry groups to develop business value. Customer pressure is the driver for the customer led network.

The final two networks, *ICT support* and *novice*, are representative of companies for whom ICT is a support tool and where customers show little interest in exploiting the relationship electronically.

4.1.4   ICT Support Network

Construction Co. was founded in 1974 to provide general construction solutions for the building industry. The firm has diversified into commercial and speculative developments and barn conversions. The managing director is the owner of the firm. The firm has 22 employees and a turnover of £3.5m. The owner has no "burning desire" to grow the business. There are no great customer pressures with local customers contributing 80% of sales. Construction Co has a well developed internal network used for business support. This network was set up by the managing director, with an electrician to help install the cabling. Staff use internal e-mail regularly. "*The Intranet provides fast and efficient communication in house*", the MD said. The technology allows sales assistants to access each other's client databases and examines previous customer contracts to assist in developing quotations.

The information system and the network is now supported by a local IT supplier. The IT supplier has a relationship with CW2000 and informed Construction Co. of the potential to be had from an investment in ADSL to contact customers by e-mail. The firm was less sure about other opportunities from the use of the Internet such as web services. Seminars from CW2000 have proved useful in improving understanding, although the firm is still unsure about the value of a web site. The IT supplier relationship is a major reason for many companies hearing about and getting involved in CW2000.

However there is little evidence of exploitation with customers. E-mail communication is limited to one customer and is not expected to increase in the near future. E-mail and the use of ADSL has been most beneficial in sharing drawings with architects and design engineers.

4.1.5   Novice Network

Machine Components was started in 1977 by the owner. The firm supplies machine components to automotive and manufacturing firms. Turnover is about £0.3m. There are currently 7 employees, 6 skilled engineers and one administrator. The firm produces computerised machines, motor racing and moulding components. These are all bespoke. The industry is declining and this is putting pressure on the firm.   The firm decided to raise capital through the sale of a building and invest in new machinery to boost business. Gaining ISO9000 accreditation has also helped here.

The firm has four computers. Two are used for programming machines for production, these are networked.   The other two standalone personal computers are used for accounting and other administrative activities. The firm uses e-mail with one customer, most preferring the use of Fax. The firm is not sure whether a web site would provide many benefits for them as they do not have a clear product to sell, rather they provide a service. However, they find it useful to be able to order on-line. The firm heard about CW2000 through an advisor at a local government investment agency. The agency provided funds for web site development, but they did not have the skills to progress the design of the web site. CW2000 provided the knowledge and skills that the firm required.

This case shows that the drive for Internet development comes directly from the managing director. Information and Communication Technologies are limited and are directed by the Managing Director. He is the focal point for all web-based relationship transactions due to the lack of skills in house. These relationships are common across micro firms in the engineering and manufacturing sectors. Companies like Machine Components, with no knowledge of ICT are reliant on external advice if they can find it.

5   DISCUSSION AND CONCLUSIONS

Novice Network SMEs are not sure of the benefits from Internet adoption. They are encouraged to participate in the project because it exists rather than for the business benefits that might accrue.   ICT Support Network SMEs have recognized the benefits of investing in internal ICT systems and see the Internet as a means of marketing and presenting a more innovative image. However, the benefits are not thought through strategically. The main benefit to these firms is impartial quality advice from suppliers such as CW2000. The managing directors are instrumental in instigating change although they are unsure of the benefits to the business.

Industry Support SMEs are looking for longer term benefits through changing the way they are perceived in the market place. However, ICT is seen as a means to an end, hence benefits are more likely to be indirect. Both the expert and customer led networks perceive direct benefits in the long term from their decision to invest in internet technologies. However, there are very different reasons in each case. Internet technologies are almost the *raison d'etre* for the expert network SMEs. They see direct benefits as an outcome of their business strategy. The customer-led network sees the internet as a means of locking in its existing customers and gaining new ones as part of their business strategy, thus turning a necessity into a virtue.

Neither government nor competitors influence decisions being made by the SMEs (Table 2). None of the SMEs know of central government schemes to support e-business adoption in SMEs. None of them use the UK Online facilities. Knowledge of e-business opportunities is determined in one of two ways. It may be based on the owners' or IT directors' knowledge or experience. Alternatively knowledge is gained from local suppliers, such as CW2000, or ICT firms and support agencies

providing consultancy services. Thus it is likely to be local intermediaries that influence SMEs choice in developing Internet technologies.

The relationships viewed in the analysis appear to strongly support the supplier/customer push theory to Internet adoption and development. Few of the companies have a formal corporate or Internet strategy. SMEs appear to be investigating the technology and looking for emergent strategies. However the owner is critical in the decision making process, even when there is an internal IT department. Mehrtens et al proposed three factors that influence Internet adoption amongst SMEs: perceived benefit, organisational readiness and external pressure. There is some evidence here for the latter two factors. However, perceived benefit is seen as a less important factor except in the case of the Industry network.

Network	Government	Competitor	Customer	IT supplier	Internal IT	MD	Industry	Consultants
Expert			X		X	X		
Industry Support					X	X	X	X
Customer Led			X		X	X		X
ICT Support				X		X		X
Novice				X		X		

Table 2: Influences on Internet adoption in Case SMEs

This suggests that government policy might be better directed at providing information and support to IT suppliers and consultants that will help them support SMEs more effectively. This can take a number of forms from practical support such as grants that can be accessed through the local suppliers to developing networks between suppliers and government agencies to assist Internet adoption.

From a strategic perspective neither the customer led nor novice networks have planned their strategic growth in any coherent way (see Figure 3). Currently the business value of the internet is low for the Novice Network. Wile the Customer Led Network considers the value of the internet to be high as customers see it as essential for the future; the firms are not planning growth strategically. However, the other three, the ICT support Industry Support and Expert networks all consider the Internet an important part of their future development. However, the business value of the Internet is not clear to the Novice network, in particular, where SMEs are testing the idea. The ICT Support Network is using the technology to provide internal efficiency while seeing little business benefit.

Business Value of the Internet	**High**	*Business Opportunity* Customer Led Network	*Business Network* Expert Network Industry Support Network
	Low	Novice Network *Brochureware*	ICT Support Network *Business Support*
		Not planned	**Planned**
		Business Growth	

Figure 3: Strategic growth Opportunities from the SME networks

The customer led network is being pushed by customers but the lack of strategic direction may inhibit the potential business opportunity. However, both the Expert and Industry Support networks see the Internet as integral to their growth and development.

Future research might focus more on the detail of the relationship between IT suppliers, consultants and SMEs. There is a need to explore the reasons why SMEs rely more heavily on their own and local knowledge. This may be because of the informal nature of strategy and the unplanned nature of growth for many SMEs, leading to the differential adoption patterns identified by Levy and Powell (2003). There is also a potential dynamic in the strategic internet adoption patterns that can usefully be explored.

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