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IS STRATEGY IN SMEs USING ORGANIZATIONAL CAPABILITIES: THE CPX FRAMEWORK

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Abstract

Developing appropriate information systems strategies (ISS) is vital, yet problematic, especially for small firms given their organizational context. However, resource-based theory may offer a solution. Building on earlier work that identified the potential from resource-based strategy for ISS, this paper considers the role of core capabilities in organizations competing in dynamic markets. Core capabilities are deconstructed into competences, processes and externalities to enable identification of future information systems. A fourth element of the analysis, evaluation, provides an opportunity to address issues that affect potential solutions. These four components form the 'CPX framework'. The framework is applied to a case firm to demonstrate its value within the overall development of an ISS. Discussion of the framework's potential and issues for future research are identified.

Keywords: SMEs, information systems strategy, core capabilities

1   INTRODUCTION

Small firms (SMEs) are poorly served by existing information systems strategy (ISS) development methods, as the ISS needs to consider the niche markets that these firms typically occupy. Many such firms have resources that are difficult to imitate. This paper proposes that a resource-based view (RBV) of strategy may be more appropriate as a basis for ISS development in SMEs.

The structure of the paper is as follows. First, a method that provides an over-arching framework for ISS development in knowledge-based SMEs is presented and the problems for such firms in using contingent models are acknowledged. The paper then considers the potential from understanding core capabilities and competences in developing ISS for SMEs. This results in a framework for the analysis of core capabilities.

Using resource-based theory, core capabilities are deconstructed into three elements, competence, process and externalities, to enable identification of future information systems. A fourth item, evaluation, provides an opportunity to address external competitive issues that impact on potential solutions. These four components form the 'CPX framework'. The framework is then explored through a longitudinal case study of an SME.

Understanding the individual competences that make up core capabilities provides a means of identifying future opportunities for IS use. This encompasses organisational issues and the effect of customers and the market. The benefits of the CPX framework are outlined, in particular the identification of required competences to support core capabilities. This enables the organisation to consider if they have supportive and competitive information systems. Finally, future research issues are identified.

2   STRATEGIC ADVANTAGE FOR SMES

Competition is often intense for SMEs. Many are small suppliers in near perfectly competitive markets and are unable to influence price or quantity. The contingent, and standard view, of competitiveness (Porter 1980) where firms compete on cost or differentiation is problematic for SMEs. They are unlikely to be able to lock in customers and suppliers, build barriers to entry, or significantly lower costs. However, such SMEs do often have processes and products that are difficult to imitate. Thus, a resource-based view of strategy may to be helpful in enabling SMEs to compete effectively. The RBV argues that competitive advantage can arise when firms 'accumulate resources that are rare, valuable, non-substitutable and difficult to imitate' (Dyer and Singh 1998, p.660).

Articulation of the resource-based view of strategy is through recognition and exploitation of the firm's core competences (Prahalad and Hamel, 1990). These competences form the basis of a business strategy. Competitiveness is no longer seen as driven by the industry but by variety created by individual firms (Dyer and Singh 1998). Rangone (1999) demonstrates the value of this approach in SMEs by identifying three core capabilities deemed essential - innovation, delivery and marketing. An SME maintains competitiveness by a combination of these capabilities.
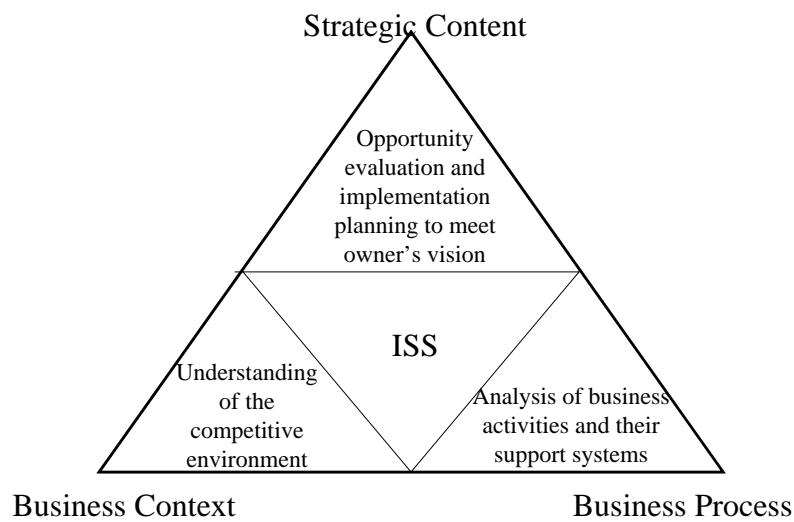
SMEs may gain competitiveness from the inimitatability in their use of resources. They may use ideas innovatively to gain competitive advantage. In such firms, IS are used to manage knowledge, and ISS are important in developing a programme of IS to manage that knowledge.

3   INFORMATION SYSTEMS STRATEGY IN SMES

Strategy in information systems has developed primarily through the contingent school of thinking, yet competitive advantage through a resource-based view of strategy requires a more organisationally-focused approach. One such framework for SMEs focuses on the role of information in supporting

strategic objectives (Levy and Powell, 2000). While the value chain provides a useful means of identifying IS in many organisations, the particular characteristics of knowledge-based SMEs mean that other tools are required to gain an understanding of their IS requirements (Duhan et al., 2001).

The organisational ISS framework (Levy and Powell, 2000) provides a means for situating an ISS for SMEs and its three aspects provide analysts with the means to focus on what the SME seeks to achieve, whether they have the systems to support these objectives, and a means of identifying necessary (Figure 1). This framework has been validated in a number of SMEs and it is used here to support research into the RBV.

Strategic Content

Opportunity evaluation and implementation planning to meet owner's vision

ISS

Understanding of the competitive environment

Analysis of business activities and their support systems

Business Context

Business Process

Figure 1: Organisational ISS Approach for SMEs (Levy and Powell 2000)

The framework has three perspectives. First, the context provides understanding of the business environment within which the SME operates. This focuses on the market and relationships with customers and suppliers. The owner's strategy for the business is elicited to aid identification of critical success factors that provide the basis for strategic information requirements. The second perspective is business process. This focuses on understanding the work processes in the SME to appreciate whether information flows inhibit business activities, and to identify changes that might be made as a result of the introduction of IS. Additionally, the information available to the SME is identified. Finally, the strategic content embodies the vision for change from the owner and the practicality of its introduction given organisational circumstances.

SMEs are not unusual in having problems identifying the core competencies and capabilities that drive them. Using soft systems methodology (SSM) (Checkland 1981) as an analytical modelling approach, Duhan et al (2001) demonstrate that it is possible to model the business themes or 'key areas of capability' required by SMEs to demonstrate excellence in their strategic objectives. The SSM analysis also enables core competences to be identified within each core capability. This allows identification of the information required by each core capability, and the systems required to deliver the information. Duhan et al identify both task-based and issue-based capabilities. Task-based competencies are those that directly support strategic objectives achievement, while issue-based competencies are over-arching capabilities that are essential for successful management of the SME.

However, an ISS needs to do more than reflect upon the current situation. The core capabilities required for future growth and development need to be identified. Additionally, SMEs need to be

aware that they may be squandering resources. There is a need to compare current capabilities with the current market environment and with future market opportunities (Duhan et al 2001). Thus, the organisational ISS framework (Levy and Powell, 2000) provides a useful basis within which to work.

There is a lack of tools for the identification of core capabilities, although Prahalad and Hamel's approach offers some insights (Duhan et al, 2001). In particular, it enables the structure of competences within the current market position to be determined. However, it does not enable the analyst to assess whether the competencies really are core. While SSM proves a useful means of analysing the business, it too suffers from the same problem.

Lewis and Gregory (1996) attempt to identify core competences in SMEs through a complex process. They view SMEs core competences as well-known and understood by senior management, although they may not be recognised as such nor clearly articulated. Yet, this does not help SMEs determine strategic objectives for future growth or in developing ISS to support their achievement.

Thus, if a resource-based view of ISS is to be developed, further tools are required. Duhan et al suggest that such tools need to elicit and define core capabilities and to provide a means of identifying the future requirements. This paper addresses these issues.

4 DEVELOPING CORE CAPABILITY MODELLING

The four key features of competence theory, dynamics, systems, cognition and holism (Sanchez and Heene 2004) are helpful in understanding the development of the capability framework below. Dynamics includes the wider market within which the business operates and whether the firm has the capacity to respond to changes. Systems are the design of relationships between resources and actors in the firm to manage complexity. Cognition is role of managers to design and organise effective organisational processes. Finally, holism is the acknowledgement of the interrelationships between all stakeholders who contribute resources to value adding processes in the firm. Thus it is necessary to define tools that are able to bring together these four features. SSM is not sufficient as it concentrates on the systemic and holistic perspectives, while the Prahaled and Hamel approach concentrates more on cognition. The dynamics of the firm are not included in either approach. This new approach to core capability modelling seeks to address this lack.

In order for core competences to generate core products or services they must be deployed within organisational business processes (Stalk et al 1992). Organizational capabilities represent the combination, coordination and deployment of organizational competences and are 'directed towards the strategic purpose of the organization' (Peppard et al. 2000). Second, organisational capabilities form the basis of business processes which are difficult for competitors to understand or emulate (Stalk et al. 1992). Rather than key technologies and skills, it is the organizational attributes of deployment, co-ordination and integration that are the ultimate source of competitive advantage. Finally, Stalk et al refer to connectivity and integration with the customer. This process intimacy allows real-time consumption data to be reflected in highly optimised ordering from suppliers and distribution.

Thus, organisational capability is a higher level concept than competence and 'core capability' is used here to mean the manifestation or exercise of core competences within business process to deliver goods and services that address real customer needs. This motivates a framework, the CPX capability framework, for the elicitation of core capabilities in knowledge-based SMEs (Figure 2).

Capability: identifier and summary of essential characteristics	
Competence	Key skills, technologies, knowledge at the heart of this capability
Process	How competencies are deployed, organised, co-coordinated and embodied in business process
EXternal	How this capability connects with customers and/or suppliers
Evaluation: • How does this capability differentiate from your competitors? • How does this capability give competitive advantage in the target market?	

Figure 2: The CPX Capability Framework

Competence is considered by reference to resources, assets, skills and technologies (Sanchez et al., 1996; Javidan, 1998). This is activated through a *process* of 'co-ordinated deployment' (Sanchez et al., 1996). The *external* dimension is considered by operationalisation of the 'market test for competence' (Sanchez et al., 1996) where proposed competences are evaluated against such market criteria as value, scarcity, inimitability, and substitutability (Barney, 1991; Rangone, 1999; Lewis and Gregory, 1996; Javidan, 1998).

4.1   Operationalising the CPX Framework

Whilst there is much discussion as to the nature and significance of core capability within a firm's strategic considerations, there is less advice on how these concepts might be operationalised. The resource-based approach has been shown to be relevant and effective in strategic planning for SMEs, but needs to be simple and quick, and not require any specialist skills (Rangone, 1999). The organisational ISS framework (Levy and Powell, 2000) has been used effectively in SMEs. It recognises the need to understand the business context, which includes the current strategy and the future potential. It also recognises the need to understand the current business processes, and the ability of the existing information systems to support business objectives. Thus, it is a framework within which to operationalise the CPX framework. The case example discussed later illustrates how the processes described now are enacted.

Strategy development methods in large and small firms often rely on semi-structured interviews of the senior executives (Gorman and Thomas, 1997; Javidan, 1998; Levy and Powell, 2000). The key questions in these exercises are, first, identification of activities at which the firm excels, second, the way in which these activities differentiate the firm from its competitors, and third how these activities give competitive advantage now and into the future.

Thus, here the business context is first established with senior managers within the SME. The focus of these interviews is to establish what the SME does well, how this compares with competitors, and why this gives competitive advantage. This provides the context to articulate the capabilities the SME requires to develop and grow.

The second stage considers the business processes from a capabilities perspective. The CPX framework provides a means of articulating organisational capabilities through consideration of the competences, processes and externalities. The focus is on pinpointing the skills and technologies at the heart of these activities, the organisation and deployment of these skills and technologies within business process, and the way in which these business processes interact externally with customers and suppliers. The outcome, from multiple interviews of staff and management in the SMEs, is a composite articulation of organisational capabilities. A systems audit forms part of this process. This allows the evaluation of IS/IT within the current set of organisational capabilities.

The final stage is strategic content where the organisational capabilities, current and future, are compared with the business process analysis. The CPX framework of IS/IT contribution gives focus to consideration of the potential for IS/IT initiatives. New technologies, products, systems enhancements and developments can all be assessed in terms of their contribution to competence, process, and

external dimensions of capability. This provides a direct linkage between IS/IT initiatives and competitive advantage through the consideration of organisational capabilities. They can be prioritised and evaluated (Ormerod 1998).

5 RESEARCH APPROACH

This research is exploratory. Hill and McGowan (1999) suggest that small firm research may be best done using a qualitative approach that includes participant observation, case studies, in-depth interviewing and use of documentation. As Silver (1998) argues 'the strength of qualitative research, for both researchers and practitioners, is its ability to focus on actual practice in situ'.

The CPX framework is novel. It is a pioneering tool that can be used to develop an ISS through core capabilities. A key objective of this research is to understand its value within an organisational ISS framework. Thus, a case study approach is apposite, as this allows the researcher to 'understand the context of the information system and the process whereby the information system influences and is influenced by the context' (Walsham, 1993). Using an interpretive framework, the validity of the conclusions relies on the 'plausibility and cogency of the logical reasoning used in describing the results from the cases and drawing conclusions from them' (Walsham 1993).

As this research is exploratory, a single, in depth, case study of an SME is undertaken to assess the CPX framework. The focus is on the firm's core production capability as this is the locus of strategic response to a rapidly changing competitive environment. The data for this case study is gathered over a period of 18 months in a sequence of regular visits. A number of semi-structured interviews were held over this period with the CEO, operations director, and several production managers. The IS/IT manager (external to ABC) was interviewed periodically to monitor systems development and confirm direct observations. Interviewees were accessible throughout this period for clarification and confirmation of data gathered.

The interviews focus first on the core capabilities. The questions here asked about the core product and the main capability required to deliver it. Once the capabilities are established the competences are determined. These include the issues discussed in the previous section particularly the skills and technologies required to enable the capability to be achieved. The processes by which these skills and technologies are organised, co-ordinated and deployed are considered. The externalities that impact on the capability are then addressed. These include the relationships with customers and suppliers. Finally, the evaluation process considers the impact of the capability within the competitive market. The data are analysed using the core capabilities principles outlined in the previous section. The analysis is subsequently verified with interviewees through discussion of the CPX articulation of the core capabilities.

5.1 Case Firm Background

The case firm 'ABC' is part of larger family owned group of companies. The group has a turnover of 16m euros and provides typesetting and printing services to international academic publishers. ABC focuses on content preparation of academic journals. Turnover is around 6m euros and dominated by one major customer. With 30 staff, and operations dependent on IS/IT, there is significant IS/IT expertise and resource available from the larger group.

The firm's core business is the electronic typesetting of academic journals, which it provides for a number of academic publishers. It specialises in scientific, technical and medical titles (STM) which can involve specialist notations (e.g. maths and chemistry), complex graphics, and photographic material with precise colour requirements. It receives academic articles in a variety of formats made up of textual content, graphics, photographs (black-and-white or coloured). These must all be converted to electronic data utilising SGML and the articles paginated according to journal-specific formats. Libraries of converted articles are built up until a journal issue is required when the

appropriate articles are aggregated together with editorials, book reviews and advertisements to produce the journal.

6 CASE STUDY ANALYSIS FOR ABC

6.1 Business Context

Historically, typesetting in the UK has been the domain of small craft-based firms. These proliferated, but in recent years there has been consolidation as major publishers reduce their suppliers and the UK cost-base became prohibitive. Within ABC's domain, publishing is dominated by a small number of large international publishers. These exploit the excess of typesetter supply and the number of UK typesetters has diminished dramatically. Increasingly, publishers use low cost suppliers in the Far East, and India for their mainstream typesetting. Whilst staff are cheap, product quality is inconsistent and does not satisfy the most prestigious academic journals. The big publishers have increased their demands for higher quality, more complex electronic product both for printing and Web publishing purposes. US academic publishers, that have previously sourced expensive typesetting domestically, are becoming increasingly aware that global sourcing can reduce costs considerably.

In the light of these environmental and competitive pressures the CEO has concluded that ABC must see itself as a global supplier of typesetting services. He envisions ABC as the world's best supplier of high quality electronic product to the academic publishers of scientific, technical and medical journals.

6.2 Business Process

The CPX framework is used here to deconstruct the core capabilities. The analysis considers the competences required for each capability, the processes that are required for it to be achieved and the externalities that may inhibit its achievement (Figure 3).

Capability: Electronic origination, typesetting, production and distribution of electronic product. Electronic origination and typesetting converting varied data sources into electronic data to high quality standards. Tracking of articles, diagrams, photos handled electronically. Journals collated, paginated and converted to electronic print and web formats. Product distributed electronically.	
Competence	Appropriate s/w tools and operator skills to convert varied data sources into high quality SGML, scanned images and diagrams. Production of data product in appropriate formats (SGML & PDF) for web or print.
Process	Customer specific workflows ensuring quality typesetting of articles and journal issue to required timescales. Sources of input data and distribution of electronic product may be anywhere in the world.
External	Raw data input received electronically from some publishers and physically by post from others Ability to distribute electronic product as required by publisher in web and/or print formats on a global basis.
Evaluation: Continual improvement in quality of coding, images and pagination required in publisher dominated industry. Ability to use low cost base in India necessary for survival. International workflows and product distribution will become threshold capabilities for sector.	

Figure 3: deconstructing core capability

By combining this understanding with the results of the systems audit, the current role of IS in supporting the capabilities is considered (Figure 4).

Capability: Electronic origination, typesetting, production and distribution of electronic product.	
Competence	Off the shelf SGML editing, image scanning, and pagination software .
Process	Developed own tracking software for progress monitoring on every journal, article and sub article component. Typesetting workflow completely controlled by tracking system. Limited typesetting by recently set up Indian operation.
eXternal	Electronic product distributed via CD ROM and manual FTP server. Interaction with India uses email and FTP driven by manual intervention.
Evaluation: Off-the-shelf software is commodity but is becoming inadequate for major customer requirements. Component tracking workflow software is superior to competition but Indian workflow volumes are minimal. External connections need automating and integrating with workflow.	

Figure 4: current role of IS/IT in core capability

Competence is concerned with the basic technologies that are employed within the organisational capability. ABC uses standard products for SGML editing, image scanning, pagination, and file transfer. While ABC has developed competences in the use of these technologies it is arguable that they are core when tests for core competence (rarity, value, inimitability, sustainability) are considered. There is little opportunity for differentiation and the generation of competitive advantage.

The processes are, however, different. ABC has expended substantial effort in developing bespoke workflow systems to co-ordinate the processing of text, image, diagram etc to produce articles in electronic data formats. These workflow systems also facilitate the aggregation of selected articles into a journal issue, and the transmission of the subsequent electronic data file to the required print firm or web host. Thus, the process dimension of the organisational capability has been developed in a bespoke fashion in order to meet exactly the firm's requirements.

ABC gains the advantage of maximising the automation of production of electronic data together with the organisation, management, and co-ordination of a large number of data file components. Within the firm it is accepted that without these systems the volume of throughput and rapid turnaround time could not be achieved.

The external dimension is concerned with the connectivity between the ABC and its customers and suppliers. ABC has established electronic links with its major customers for the input of academic article materials where previously these were delivered by the postal services. Similarly, it has automated despatch of electronic data product to printers and web hosts nationally and internationally.

6.3   Strategic Content

The final stage of strategic content is to compare the broader organisational capabilities identified in the business context with the CPX analysis. This leads to identification of the future role of IS in supporting or driving the business strategy.

The CEO's vision of ABC has the world's best supplier of high quality electronic product to academic publishers of STM journals is predicated on the successful leveraging of current capabilities and the development of new capabilities in a global context. This requires the ability to service global customers at a cost which is globally competitive and to meet ever-increasing demands in electronic content manipulation.

Following an unsuccessful partnership arrangement with an Indian typesetter, ABC decided to set up its own facility. This requires the establishment of a typesetting capability in India, and continuing development to reach the quality standards prevalent in the UK. This capability will be underpinned with the UK developed IS/IT, adapted for use in the new environment, and supported by continual and long-term training and development programmes.

European academic publishers (and, more recently, US customers) initiate and manage their supply contracts through the UK-based firm. It is therefore essential that the typesetting workflows are able to

integrate the Indian operation in a completely transparent way and that article tracking (i.e. process status) should be visible irrespective of where the article is being processed. Final electronic product for printing or Web publishing is collated in the UK and may be dispatched electronically to printers and websites world-wide.

ABC's dominant customer is continually requiring improvements to the electronic product in terms of content complexity and pagination requirements for printing. They are also keen to establish a seamless interface with ABC through integrating work flows on the input side, and automated electronic product distribution.

The implications for the organisational capability in electronic typesetting can be assessed by application of the CPX framework. Thus, new competence in content manipulation is required; the process dimension must be enhanced by transferring UK workflow technology to the Indian operation and integrated seamlessly with UK workflows. Further, the external dimension must allow customers to submit article components and receive electronic product anywhere in the world with minimal manual intervention.

The future role of IS/IT in leveraging current and developing future organisational capability can now be outlined (Figure 5).

Capability: Electronic origination, typesetting, production and distribution of electronic product.	
Competence	Have developed own software for advanced syntax and content validation. Invested in latest scanning technology. Enhanced pagination software to meet key customer requirements and reduce manual interventions.
Process	Indian operation takes on adaptation of UK workflow system. Workflow system extended to thread both UK and Indian locations. Job status can be monitored transparently irrespective of geographical location.
eXternal	Input of article materials achieved electronically through integration with major customer IS. Electronic product distributed as required by customer in web and/or print formats on a global basis using automated FTP server.
Evaluation: Successful completion of these developments will give ABC global reach and place them significantly ahead of competition. Highly automated workflows will improve delivery times and facilitate higher volume throughput. Volume use of low Indian cost base will have large positive effect on profitability.	

Figure 5: future role of IS/IT in core capability

ABC lives in a dynamic competitive environment. It is faced with global competition, and is effectively coerced by its more powerful customers. The search for competitive advantage is played out through the market assessment of competence, which results from the interplay of a firm's resources and capabilities. Thus, larger customers require ABC to have a quality typesetting capability in a low-cost environment such as India; they require ABC to manage the production of article banks and the release of journal issues in a coherent and integrated fashion; they require ABC to interface with their own work flows and to dispatch electronic product to any global destination. This discourse is carried out in terms of 'organizational capabilities' and strategic decisions are implemented through the leveraging of existing capabilities and the building of new ones.

The CPX framework allows an articulation of organisational capability in which the significance of IS/IT can be evaluated; where the contribution of IS/IT to further leveraging of the capability can be suggested; and where the role of IS/IT in building new capabilities can be defined. A coherent linkage from competitive environment through strategic logic implemented through organisational capabilities, enabled through the use of IS/IT, can be shown.

7 DISCUSSION AND CONCLUSIONS

The resource based view is particularly apposite for SMEs operating in a customer dominated environment. Whilst the CPX framework may be applicable in larger firms, the visibility of capabilities within SMEs make them a more accessible exploratory context.

The dynamic environment in which SMEs are working drives the need for change and innovation to compete in the market. SMEs, as other firms, need to use information resources effectively to respond to the competitive pressures. Information systems strategy provides the means to understand the information and information systems requirements. However, most ISS tools are derived from the contingency perspective that considers the "snapshot in time". The need for development of analysis tools to consider this dynamism and enable SMEs to respond effectively drives this current research. While the systemic, holistic and cognitive aspects of competence theory are addressed by current tools and techniques as discussed above, it is clear that there is nothing to consider the dynamic response of firms. This research develops the CPX framework to include all four elements of competence theory.

The organisational ISS framework (Levy and Powell, 2000) provides a means of situating the core capabilities analysis provided by the CPX framework. The business context is necessary to understand the markets and relationships within which ABC operates and hence to understand the dynamic environment which is considered in the evaluation of each capability. The main use of the CPX framework is seen in the business process analysis and the strategic content opportunity identification.

From the case analysis it can be seen that the CPX framework can be used to articulate organisational capabilities which can then be deconstructed into competences supporting each dimension. It is the relationships between the competences, processes and externalities that lead to competitive advantage. This accords with the ideas of Stalk et al (1992) which recognise that capability is more than the individual skills and technologies.

While the business context analysis initiates the dynamic element, the competence/process relationship enables the development of the systemic, cognitive and holistic elements. First this is achieved by understanding the interacting capabilities within the firm which provides the systemic perspective. Second the framework facilitates the design of organizational capabilities implicit in senior management cognitions of strategy. Thirdly the framework provides a holistic evaluation of the contribution of organizational capability to strategic objectives. The analysis provides the basis for a review of current capabilities which leads to decisions on either to enhance or identify new capabilities to respond to the dynamic environment. Figure 6 demonstrates the link between current and future capabilities within competence theory:
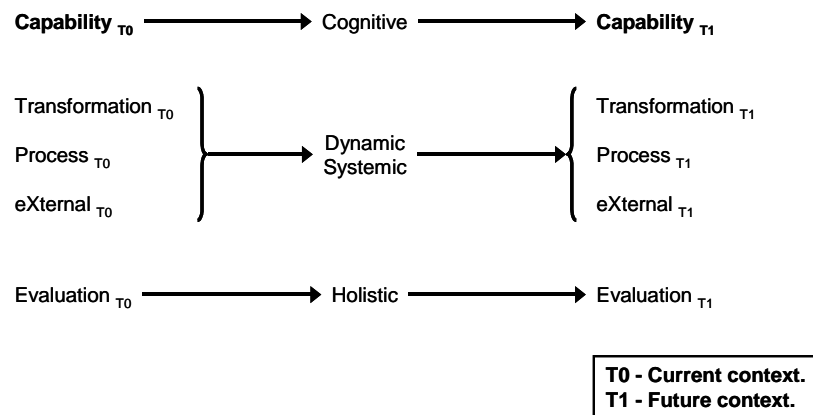

Figure 6: Capability Development within resource based strategic management theory

The analysis of the four elements enables the role of IS/IT to be easily assessed and its contribution to competitive advantage evaluated. It would appear that it is more likely, as software and technologies mature, that it is in the process and externality dimensions that the application of IS/IT provides the differentiation and inimitability at the heart of core capability. These uses of IS/IT embody the way in which firms operate and the relationships they have with their customers or suppliers.

The strategic discourse under these conditions is not concerned with the low-level consideration of business process activities and their linkages, as demonstrated by a value chain analysis (Porter and Millar, 1985), nor with attempting to identify the significance of individual IS, as may be shown through the use of the McFarlan and McKenney strategic grid (Earl, 1989). These tools are of limited value in analysing the firm from a resource-based view. They do not provide the richness in analysis that knowledge-based firms require if opportunities from IS are to be identified.

Where strategy has been derived from a resource-based view, strategic options will involve the identification of potential new core capabilities that need to be developed in order to meet the expected needs of some future marketplace. These competences need to be co-ordinated and deployed to provide new organisational capability. This paper identifies the role of evaluation as critical to consideration of sustainability of future IS opportunities. However, this needs further research.

To use the taxonomy of Earl's (1989) framework of frameworks, the CPX framework represents an opportunity framework which can be used to draw out possibilities for IS/IT in enhancing and extending core organisational capabilities. The competence dimension might be enhanced through the availability of new technology or software products bringing new competences in the fundamental transformations at the heart of the capability. The effectiveness and efficiency of the process dimension might be enhanced by new IS/IT allowing new ways of combining and coordinating the content competences. New ways of effecting customer or supplier external linkages provide opportunities for closer integration. Such considerations when applied across the complete set of organisational capabilities within an SME will generate a list of possible IS/IT developments for inclusion in an information systems planning exercise.

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