



Strategic Positioning of a Small to Medium Sized Enterprise Using Groupware

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ABSTRACT

This paper discusses the strategic importance of Groupware to Small to Medium sized Enterprises (SMEs) and describes an application. The importance of technology applications that actually generate strategic advantage is discussed. Many advantages of Groupware in SMEs are highlighted. These include improved communication links, diffusion of knowledge and enhanced management of projects. Limitations are also discussed. The paper concludes that the main problem with the development of strategic advantage is concerned with the exploitation of knowledge generated from improved value creation by human capital. The challenge is to develop unique expertise in value creation that cannot easily be emulated by competitors rather than implementation of technology alone.

INTRODUCTION

Groupware is defined, for the purposes of this work, as the use of networked computer aids that are designed to assist collaborative work groups in their team functions. In the strategic implementation of a Groupware system in a Small to Medium sized Enterprise (SME), it is imperative to create a structure for adding value in the organisation that creates competitive advantage. In many technology investments, companies and other organisations have not reaped the benefit of new technology because it has been applied in a way that does not create particular strategic competitive advantage over competitors, simply allowing them to copy the technology application. The strategic fit of the activities that a company carries out is unique and the basis of competitive advantage. Groupware should be viewed in this light.

The challenge to SMEs is often more intensified because many are competing on project-based work on tight profit margins, in industries where there is little differentiation between them and their competitors. Additionally, trends towards networked organisations may require that team members are located remotely from each other, perhaps even in different continents (Edwards and Gibson 1999). This is particularly relevant to SMEs whose resources may not allow them to secure services in diverse areas of expertise locally. Hence, a coordinated workflow and group activities through a virtual networked organisation, as described by Rusinkiewicz and Georgakopoulos (2000), is rapidly becoming the reality for SMEs. In strategic terms, Groupware becomes a mechanism by which SMEs can enhance their competitiveness by gaining flexibility and focussing on particular goals. Porter (1996) talks of the difference between operational effectiveness of organisations and competing by being different in a way that competitors cannot easily imitate. This paper postulates that, whilst Groupware is in reality little more than a technology enhancement that any company could establish, its use in a strategic fashion will allow innovative SMEs to create a unique strategic fit and competitive advantage that their competitors would find difficult to emulate. An SME software development company has been used as a case-study subject.

ORGANISATIONAL STRUCTURE AND CULTURE OF THE TARGET ENTERPRISE

In the strategic implementation of a Groupware system in an SME, it is necessary to enhance communication between different stakeholders in the virtual workplace. Part of this process requires an understanding of the dynamic and complex nature of organisations that operate in constantly evolving environments. Preece (1994) states that organisations are complex entities consisting of a number of factors that interact with each other. These are: -

1. The employees within the organisation – Within an organisation, each employee will have differing rôles, expectations of others, motivations within that organisation and aspirations to achieve. However, Preece (1994) does not add that workers must also maintain a united strategic focus on how their rôles contribute to the overall strategic direction for the organisation.
2. The technology used and created – Each organisation has different functions, dependencies and reliabilities and uses technologies to advance in their respective working environments.
3. The organisational structure – This would be the formal structure of the organisation, how work is allocated amongst employees and the number and types of groups that exist in that organisation. It also describes the levels of hierarchy that exist in an organisation. Many authors, e.g. Wee (1994), have also highlighted the dependency between structure and strategy. The structure of an organisation must be appropriate to achieving strategic goals.
4. The organisational culture – Trompenaars and Hampden-Turner (1997) describe organisational culture as being the “shared norms of behaviour, values and assumptions that knit a community together”. Norms are the acceptable behaviours within an organisation, values are what an organisation feels is right or wrong, and assumptions are the underlying beliefs or paradigms of the organisation.

The enterprise selected for study has a rigid hierarchical structure in place and there is a clear distinction between management and employees. One of their requirements is to produce better

communication links across the functions that exist in the company. Additionally, physical differences in the location of departmental functions mean that often employees in one department would have to physically move themselves to another department to communicate face-to-face.

The purpose of implementing a Groupware system within an organisation is to provide a framework for supporting and enabling employees to interact with each other, and form a basis for team working and coherence within the workplace (Nunamaker et al 1992). The needs of a group using a Groupware system are different to the needs of an individual. Therefore, it is important that these differences, in respect of interactions and processes between groups, are considered in order to deliver effective tools to support employees in the workplace.

THE MAIN BENEFITS OF GROUPWARE EFFECTIVENESS FOR THE ORGANISATION

1. Team formation – By implementing the Groupware system, it would be possible to mould together a team to work on a specific project in an efficient fashion, and then accordingly disband it when the goals are achieved.
2. Increased job satisfaction for employees – Employees should find it easier to obtain the resources and information they need via electronic communication and a unified database and should feel that they are providing a greater level of contribution within the organisation, leading to enhanced achievement of the organisational strategic goals.
3. Helping each other – Employees have the opportunity to help each other by transferring information using a unified messaging system. This should, in turn, increase team spirit and promote the sense of “working together”, contributing to a unified sense of purpose oriented towards strategic goals.

EMPLOYEES ARE THE MAIN ISSUE

One of the fundamental problems is encouraging people to share the knowledge they are used to keeping to themselves in their individual functions and realising that dispersing this throughout the organisation would bring about huge strategic benefits to the company as a whole. Knowledge and skills are the intangible assets that drive a company. However, it is the sum of the knowledge that is strategically important, rather than the individual parts (Edwards and Gibson 2000). This is what creates value from human capital. Employees who are required to share information in a Groupware-enabled organisation may be reluctant to do so for fear of potentially losing job status within the organisation. The challenge, therefore, is in culture change and educating people into feeling secure and confident in working in a technically based team environment. One advantage in many SMEs is that the general ethos of working as part of project teams already exists due to the large extent of project-based activity. This may serve towards being an important prerequisite if the Groupware system is to thrive, grow and create strategic advantage.

COMPUTER SUPPORTED CO-OPERATIVE WORKING (CSCW)

CSCW is the study of the way employees can work together using computer technology. Dynamic SMEs have a wide diversity of projects and clients. There is an important requirement for CSCW tools within companies that would enable interactions between all of the parties involved in projects, from the initial development stage to the completion.

For some time, Lloyd (1994) has argued that the use of future CSCW applications will impact upon the nature of the

design process and the quality of the design itself. Most of this impact will be positive. For example, an employee could seek advice early on in the design stage of projects because technical experts in the organisation were more accessible through the usage of electronic mail and shared technical support folders. Previously, employees had to directly approach the expert or leave a note when they were not located. This increased accessibility to experts was found to increase the quantity of feedback. However, one noticeable problem with this was that the expert was quite often overwhelmed with the number of requests received for technical information. A solution proposed was to design public folders for group discussions regarding problems for on-going projects. In this way, the expert was able to pro-actively access these folders when free time was available to do so.

Other issues highlighted by Lloyd (1994) are the problems concerning the control of projects via Project Management. Review processes for projects using CSCW have to be efficient to ensure that the status of completed jobs is always known during projects. An electronic Job Form has to be designed so that Project Managers are aware when a team had effectively completed a job and they could “sign-off” this activity.

COMPUTER SUPPORTED CO-OPERATIVE WORK SYSTEMS – WHERE AND WHEN COMMUNICATION OCCURS

CSCW Systems that incorporate the use of Groupware can be classified in a number of ways. One of these is where and when participants in an organisation perform their co-operative work. An often-cited occurrence is where excellent ideas for ongoing projects were discussed between employees in the corridor, or whilst waiting for the photocopier, because this was the only “free” time these employees had. The Time/Space Matrix is extremely useful for understanding the design and architecture of the proposed system because it shows the particular situations that a Groupware system aims to address.

	Co-located (Same Place)	Remote (Different Place)
Synchronous (Same Time)	Face-to-face conversation	Telephone
Asynchronous (Different Time)	Post-it note	Letter

Figure 1 - Time/Space Matrix for non-computer technologies

Figure 1 shows how the non-computer technologies fit into the Time/Space matrix (Dix et al 1998). The time axis can be divided into synchronous and asynchronous systems, for example a telephone call between one employee and another is defined as being a synchronous, remote communication mechanism. Identifying the differences between synchronous and asynchronous communication can be extremely difficult. For a proposed Groupware e-mailing system in the studied SME, there would be no difference in whether employees in one office were operating at the same or different times. Another distinction specified by Dix et al (1998) is that synchronised systems occur when there is a computer connection and unsynchronised where there is no computer connection.

OTHER TYPES OF SHARED INFORMATION IN THE WORKPLACE

The concept behind shared electronic diaries or calendars within a workplace is that each person uses the shared system that is accessible to all parties. When one person wishes to arrange a meeting with another employee, this person can check the employee's diary and then make a request via e-mail to arrange a meeting in this free slot. Shared diaries of this type do create technical problems within the workplace, which have to be recognised if the configuration of public folders is to be successful. Problems identified included trying to establish who was actually attending the meetings in the shared calendars. For example, if "Project Manager" was booked into a meeting, would this mean that all Project Managers would be involved in this meeting or just a specific one?

Another potential problem that arises is that of privacy. For example, would it be common practice for an employee to see what another employees were doing during the week? One way around this would be for the user to keep private information in a private information store only known to the user, and keep public information on the shared public database. This way, employees could specify which tasks they regarded as being private and which tasks they regarded as being acceptable for others to see. However, it must be recognised that this solution may discourage knowledge sharing and co-operation.

CSCW FRAMEWORKS FOR INCORPORATING GROUPWARE USING THE TIME/SPACE MATRIX

Figure 2 shows how CSCW frameworks can be incorporated and described in terms of synchronous and asynchronous transfer (Dix et al 1998). Dix et al (1998) described this matrix as becoming a common language amongst the CSCW community. This diagram helped to plan what types of interaction would occur in the company with their Groupware systems and the types of communication transfer that would exist. It was clear that the design of synchronous transfer activities would be vastly different to those of asynchronous transfer. Systems such as Microsoft Exchange Server can operate in both synchronous and asynchronous modes. For example, synchronous modes of communication would use a Remote Access Dial-In connection to establish a "Chat" session between one local employee and other remote employees. The particular system described in this paper will focus mainly on asynchronous transfer.

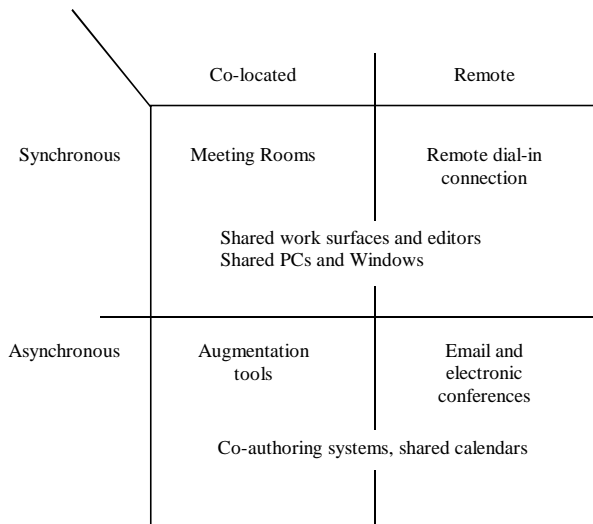


Figure 2 - Synchronous / Asynchronous Transfer Modes

IMPLEMENTATION

The first stage of implementing Microsoft Exchange Server on the company's computers was to list the types of applications and services that the system users required, such as e-mail connectivity, shared calendars, public folders and basic network security. The naming strategy employed was one that made it easy to identify and add sites, servers, gateways, connectors, users and all of the other objects relative to the Groupware system. In this case, the naming conventions were based on the location within the company, to simplify the task of the systems administrators and cater for any additional requirements in the future.

It was important to implement Microsoft Exchange Server so that information was available to a wide audience within the organisation, which meant making information available to a range of job functions within the company. Some individuals in the company, such as administrators and directors, needed more access to information and resources than other staff. It was possible to control who could use these Exchange resources by granting and restricting access to directory objects and public folders as well as individual mailboxes. This was important for the finance department as only the Director and Business Administrator were granted access to the financial public folder. This might be seen as a dubious practice in terms of fostering team co-operation and illustrates the need for more open and transparent sharing of knowledge. Consequently, if a team should require this information in order to be successful in assessing their progress towards the achievement of strategic goals, then a simple re-configuration of access rights would be all that was necessary.

Public folders were designed and configured to act as information directories for grouping data concerning customer projects, availability of rooms and information on staff whereabouts for sharing data amongst users, particularly when working in cross-functional project teams. One of the primary advantages of using public folders was the diversity of information types that could be stored. These ranged from simple or complex e-mail messages, to calendar dates and graphics for job specifications. The public folders also hold the custom forms, used to design job specifications, support calendars and various other custom designs.

These public folders represented a permanent storage database for information and allowed authorised users to update the information as and when required. Such information could be available to all employees and their purpose was to create effective communication whereby employees could act as a cohesive group, work together to solve problems and use information to aid the progress of projects. Public folder information was effective because one client (user) could quickly add information from any workstation and then post it immediately onto the public folder located on the Exchange Server Computer. This would then be immediately updated on all other clients.

Another advantage of using public folders was that they could be customised to display different views that organised specific characteristics of the information according to the requirements of the individual user. It was also possible for users to add the public folders they used most frequently to their list of favourite public folders. The system could be tailored to suit the individual needs of users at the company, making their respective jobs easier and therefore making them more willing to act and participate as a team.

CONCLUSIONS

Both employees and managers reported that the Groupware system had greatly improved the overall effectiveness of business processes within the organisation. Other benefits reported by

users were the centralisation of information using this unified messaging system, the ease of accessibility to reach information, the improved review of documentation and the overall improved communication processes between individuals and teams.

Shared folders facilitated spontaneous forms of help that had not been possible previously. Shared folders have allowed (for the first time) a holistic view of the work being performed by all project managers, the support team and the programmers as well as the business administration activities that occurred within the company. This in turn has facilitated the possibility for pro-active collaboration.

Even though it was noted that work continued to be executed individually, the shared folders began to clearly distinguish the differences between working individually and working within a group. One of the most significant differences noted was in the response to a customer call. Originally, notes of the call were taken on private scratch pads, then researched and resolved individually. Here the notions of individual workspace, responsibility and problem ownership were clearly defined. Once the Exchange Server was implemented, customer problems were recorded into the shared folders that were accessible to the rest of the employees, where they were researched and resolved by any team member. The concept was that once a document was placed into the shared folder, it would become the joint responsibility of the group as opposed to being the responsibility of the individual.

The overall lesson learnt, as cited by Dix et al (1998), is that Groupware systems should aim for some level of symmetry. That is to say, if one employee does some work on the Groupware system, then that person should receive some benefit from it. For example, if an employee puts effort into maintaining a shared calendar, this information will be transmitted across all other clients and will save this employee having to give out new availability dates using paper or on an individual basis.

The ultimate aim of the Groupware system was to develop strategic advantage for the company. This meant establishing new working norms with the aid of Groupware to make individual tasks for employees easier, as well as improving the communication links within the company so that group interaction was more of a commonality. Message delivery speed has greatly benefited employees at the company, even compared with telephones. For example, employees telephones were often engaged when speaking to customers, so that when a call came through from a waiting customer, a message could be taken by another group member and then directly e-mailed to the intended recipient without having to wait for them to finish on the telephone.

This Groupware implementation brought many immediate benefits to the way in which employees communicated with each other in the office. The physical design of the office before the Groupware implementation reflected the hierarchy, which existed in the company. For example, the Project Management team was located on a different floor to the Programming department. Previously this meant that if a Project Manager had a query about a job that a Programmer had finished, they might have to physically walk to the Programming floor and then query this through face-to-face communication. The Programming Manager did not often welcome this, as it meant that Project Managers disrupted his Programming team. After the Groupware implementation, it was possible for Project Managers to directly access Programmers when they appeared to be free (from the shared calendar), and then to query a particular job by e-mail or set up a meeting request in one of the available rooms. Also previously, Programmers would argue that when directly approached by Project Managers, they would often have to give in to the Project Manager's demands. However,

the Groupware system fostered a more reasoned approach, either by virtue of the necessity to put it in writing or make an appointment.

The overall benefits of this type of system are hard to quantify (in terms of the cost outlay), but over time, as the system develops, it will become clear that a competitive edge is achieved by enhancement of communication using Groupware technology. In this way, the company can continue to remain dynamic and ultimately survive alongside larger players in the market.

However, it is well to highlight one major limitation of this application. The SME studied continues to separate management from actually doing the job. This probably reflects a prevailing culture in many SMEs. Organisations of this size often develop from well-established businesses, perhaps with a family history. Alternatively, they may be built up by entrepreneurs who have previously worked in companies where there is similar clear delineation between managers and workers. There can be little doubt that strategic advantage is achieved by developing an open and transparent team culture where the team's objectives and goals are clearly aligned with the strategic aims of the organisation's as a whole (Peters 1997). This probably cannot be achieved wholly unless management are prepared to share information and knowledge that will enable all to gain a unified strategic focus. Perhaps SMEs that are able to embrace this challenge will be the ones to gain the most significant strategic advantage. Management must provide scope for the organisation to experiment with, discover, learn from, evolve and continue to build organisational innovations around new Groupware technologies such as Exchange Server.

In the future, bridging Groupware technologies, like Exchange Server, may have an important rôle to play in organisations striving to achieve strategic advantage. By providing more workflow and shared project folders than simple desktop computers or client-server systems with e-mail, being highly flexible, and having the ability to use a range of information structures, new standards in communication within organisations may be developed. The SMEs who develop expertise in creating customer value from these systems will achieve strategic advantage because this capability will not easily be copied. The challenge will come in achieving the cultural change that will enable this expertise to be developed.

REFERENCES

- Dix, A., Finlay, J., Abowd, D. and Beale, B., 1998, *'Human Computer Interaction'*, Prentice Hall, Europe, p465-489.
- Edwards, J. and Gibson, P.R., 1999, *'Strategic Advantage through Software Development for Computer Supported Co-operative Work'*, Asian Journal of Business and Information Systems, 3/4, p177-195.
- Edwards, J. and Gibson, P.R., 2000, *'Knowledge Management Using CSCW In Global Strategic Alliances And Joint Ventures'*. The Knowledge Management Conference, Ed. Edwards, J. and Kidd, J., Operational Research Society, KMAC 2000, Birmingham, UK, July 2000, p376-384.
- Lloyd, P., 1994, *'Groupware in the 21st Century – Computer Supported Co-operative Working Toward the Millennium'*, Adamantine Press Limited, p162-180.
- Nunamaker, J.F, Dennis, A., George, J.F., Martz, W.B., Valachich, J. and Vogel, D., 1992, *'Computer Augmented Teamwork: A Guided Tour'*, Van Nostrand Reinhold.
- Peters, T., 1997, *'The Circle of Innovation'*, Hodder and Stoughton London.
- Porter, M.E., 1996, *'What is Strategy'*, Harvard Business Review, Nov-Dec, p61-78.

- Preece, J., 1993, '*A Guide to Usability Human Factors in Computing*', Addison-Wesley Publishing.
- Rusinkiewicz, M. and Georgakopoulos, D., 2000, '*From coordination of workflow and group activities to composition and management of virtual enterprises*', (Ed Kambayashi, Y. and Takakura, H.), International Symposium on Database Applications in Non-Traditional Environments, IEEE Computer Society, Los Alamitos, USA, p3-15.
- Trompenaars, F. and Hamden-Turner, C., 1997, '*Riding the Waves of Culture: Understanding Cultural Diversity in Business*', Nicholas Brealey, London.
- Wee, C.H., 1994, '*Sun Tzu's Art of War: Selected Applications to Strategic Thinking and Business Practices*', International Review of Strategic Management, 5, p83-92.

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