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A Tale of Two City Call-Centres

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Abstract

This study uses Zack’s four knowledge problem model to examine knowledge strategies within a call-centre environment. Two government departmental call-centres are presented as case studies. The study confirmed the two problem types uncertainty and complexity were generally resolved in the call-centre while ambiguous and equivocable problems were consigned elsewhere. The solution of the former problem pair relies on knowledge that is codified and stored in databases. The latter seeks out experts who apply both technical and functional knowledge to the problem resolution. The researchers advise managers to be aware of the need for capability to solve all four problem types and to develop knowledge strategies to target each.

Keywords

Knowledge Management; Call-centre; Information Systems.

BACKGROUND & STUDY MOTIVATION

One strategy the public sector is embracing to enhance services is e-government: the application of communication and information technologies to the organisation and operation of government (Teicher, Hughes, & Dow, 2002). An element of e-government strategy is the call-centre. Side-by-side with internet-based services, the call-centre remains a central plank in government’s service delivery platform for both public and internal inquiries. The taxpaying public expects government call-centre advisory and support functions to provide efficient and quality advice in an equitable manner.

Government Agencies are now expected to develop performance indicators for the services they provide, that is, some way of measuring the progress toward government declared objectives. But difficulties lay in the measurement of service outputs and outcomes (Teicher, Hughes, & Dow, 2002). More meaningful measurement will be founded on the decomposition, closer examination and greater understanding of these services, including those provided through call-centres. In the quest to improve government service quality, efficiency and effectiveness one must ask: “How do workforce and technical strategies combine to assist the enterprise excel at customer service?” In order to develop a defensible response to such a question, the following research question was posed: “How well does Zack’s framework represent problem types or effect strategy in a public sector call-centre environment?” Looking at call-centres through a knowledge management lens has potential to provide guidance in this pursuit. The models and descriptions in this paper are first steps towards a better understanding of the knowledge-intensive environment within the call-centre.

This paper has three sections. The first section describes Zack’s ‘Four Problem Framework’ including his suggested information system strategies for dealing with these knowledge problems. The second section contains a summary comparison of two government call-centres (the underpinning rich and detailed case studies have been omitted due to paper size limits). The third section applies Zack’s model to the problems faced by call-centre agents and discusses the knowledge strategies of the centres. Some concluding remarks provide advice to call-centre management arising from this study.

A CONTEXT FOR THE STUDY

In Dickens’s novel, A Tale of Two Cities, England and France had similar societal structures and depending on personal circumstance could be described as "the best of times" or "the worst of times.” However no one was able to predict the impending radical change to these societies. Similar upheaval in call-centres is predicted by Gartner researchers (Close, 2003).

Call-centres have become the major access point for customer interaction. Many are transforming traditional backroom call-centres with rejuvenated technology to become a key front-line of the enterprise (Anton, 2000).
The major business driver for call-centre expansion, particularly within the public sector, is cost. Riggs and Thyfault (1999) estimated the cost of handling a phone call is $3 compared to $25 for responding to a written letter, the traditional communication channel for government bureaucracies. Compelling reasons cited for improved call-centre service include loyalty, attracting new business, cost cutting as well as demand from customers (Wilde, 2000). The authors suggest that knowledge management strategy is a determinant of service performance in a call-centre.

Call-centre performance measures don’t necessarily create the link between service quality and business goals. Callers use call-centres to get information through interaction with a person in a convenient way. The measures predominantly published on call-centre performance relate to time in queue (on hold), time in conversation, calls per hour and other similar quantitative measures. Duder and Rosenwein (2001), for example, suggest a formula to calculate the number of call-centre agents to achieve zero abandonment rates. Their argument is that by reducing time in queue, abandonment will fall and the quality of service will improve. The US Internal Revenue Service employed a similar operations research approach where the main objective was to allocate resources in such a way as to minimize the number of customers who receive a busy signal or who must hold for a long time when they call for information (Harris, Hoffman, & Saunders, 1987). In addition, Qantas (Gaballa & Pearce, 1979) employed a model utilizing queuing and integer linear programming to reduce waiting time and evaluate the relationships of staff size to waiting time and service time.

While these traditional measures have served efficiency management it has been at the expense of the development of effectiveness measures. In the call-centre environment, effectiveness can be improved by measures related to quality of advice. This requires a different perspective. The authors believe that employing a knowledge view on call-centre activities will progress this goal of appropriate effectiveness measures.

**KNOWLEDGE PROBLEMS**

According to Zack (1998) different types of knowledge problems are best processed by differing knowledge and information systems strategies. Zack’s knowledge problems are summarised in Table 1. For each of his knowledge problems, Zack (1999) suggests a number of information systems strategies. For problems of ‘Uncertainty’, he suggests: (1) providing central repositories to enhance the ability to locate codified and documented information; (2) providing automated capabilities to analyse large amounts of information; (3) configuring communication networks in highly flexible ways to respond to unpredictable information processing needs; (4) enabling communication regardless of geography or time; and (5) enabling broadcast at-large requests for information and knowledge, eliminating the need to know precisely where it is located.

**Table 1 - Summary of Zack’s knowledge problems**

<table>
<thead>
<tr>
<th>Information</th>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Uncertainty</strong></td>
<td><strong>Ambiguity</strong></td>
</tr>
<tr>
<td>Insufficient factual information about the goal, situation or task, and lack of confidence in the consequent inferences, estimates or predictions</td>
<td>Inadequate knowledge (patterns/concepts) about, no explanation for, or understanding of a goal, situation or task</td>
</tr>
<tr>
<td><strong>Complexity</strong></td>
<td><strong>Equivocality</strong></td>
</tr>
<tr>
<td>Too many situational elements and relationships to coordinate or consider simultaneously</td>
<td>Multiple interpretations of a goal, situation or task</td>
</tr>
</tbody>
</table>

For problems of ‘Complexity’ Zack suggests (1) auxiliary high-capacity memory for managing and rapidly analysing complex sets of information i.e. computer-based decision support systems, database systems, and expert systems; (2) develop searchable online repositories of explicit knowledge to leverage the organisation’s experts; (3) develop the ability to spontaneously and quickly locate experts; and (4) facilitate decentralised decision-making by making local information available globally and global information available locally.

Becker’s strategy (2001) to reduce uncertainty involves acquiring increasing amounts of information until the problem is diminished in terms of uncertainty. He also suggests that a problem defined as ambiguous will not be resolved by this strategy; rather it may make it worse. The information already at hand needs to be processed in order to reduce an ambiguous problem to a complex one.

For issues of ‘Ambiguity’ and ‘Equivocality’, Zack suggests the provision of communication technologies to best support dialogue between a flexible and responsive network of experts and associates. The purpose of the dialogue is to transform problems of ‘Ambiguity’ and ‘Equivocality’ into problems of ‘Complexity’ and ‘Uncertainty’. In some ways Zack’s approach is similar in nature to Hansen, Nohria and Tierney (1999) who
when describing their two knowledge strategies, codification and personalisation, promoted the use of information systems in their codification strategy and communication technologies in their personalisation strategy. The nature of the problem types (queries) directed at the call-centre effects the strategy employed to respond to that problem. Two government call-centres have been analysed and a summary comparison provided. Discussion then ensues analysing how Zack’s problem types are processed by these call-centres.

**COMPARISON OF CC1 AND CC2**

CC1 operates within a government department whose principal business is to maximise the economic potential for agricultural industries on a sustainable basis while CC2 is a call-centre in a government department that promotes the existence of a fair and ethical marketplace. CC1 has developed from a planned strategy to provide accurate and timely information as part of an integrated approach to client management. Based on a personalised service and supported by training and coaching, the approach is to protect clients from the technology driving the call-centre. CC2 has evolved from business pressure to cope with increasing demand for timely and accurate advice. Efficiency continues to be the major business driver in CC2. Table 2 summarises the strategies employed in each of the call-centres.

<table>
<thead>
<tr>
<th>Strategy</th>
<th>CC1</th>
<th>CC2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of IVR/ Call Routing</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Call Rate</td>
<td>80 calls per person per day</td>
<td>Up to 200 calls per person per day</td>
</tr>
<tr>
<td>Information recorded on calls</td>
<td>Minimal – for reporting and return contact purposes</td>
<td>Minimal – for reporting and return contact purposes</td>
</tr>
<tr>
<td>Updating of information repository</td>
<td>Meetings with scientists / 2nd Tier operatives</td>
<td>Not involved</td>
</tr>
<tr>
<td>Internet site</td>
<td>All information available</td>
<td>Limited information available</td>
</tr>
<tr>
<td>Consignment Policy</td>
<td>Consignment if query cannot be resolved with standard information</td>
<td>Research performed by agent prior to consignment</td>
</tr>
<tr>
<td>Remuneration for operators</td>
<td>Government clerk level 4</td>
<td>Government clerk level 3 &amp; 2</td>
</tr>
<tr>
<td>Training</td>
<td>6-8 months</td>
<td>2 weeks</td>
</tr>
</tbody>
</table>

Table 2 - Comparative Strategies of Two Call-centres

**ANALYSIS AND DISCUSSION**

This paper will now discuss the preceding case studies using Zack’s ‘four problem’ model. Zack (1998) suggests the response to complexity is to either “increase a firm’s capacity to process it or to reduce the level of complexity”. Both CC1 and CC2 commence dialogue with the caller by following an initial scoping questioning technique. CC2 takes longer (due to the need to respond to the IVR prompts), but directs callers with complex problems to the more capable staff within the team. The superior, yet more complex, IVR programming provides this capability.

The system generates monthly call-time reports for CC2 staff. Their objective is to minimise call time. The impact of this is the time available to decompose complex problems during the call is reduced. Once the CC2 agent decides time will limit resolution the problem is consigned either to tier 2 specialists or it may be set aside for further research by the agent at a later time. CC1 operators do not specialise in particular functional areas, but are not considered to be fully trained until after several months of training and mentoring. This knowledge increases the call-centre capacity to deal with complex problems. The higher levels of remuneration also increase the likelihood that more talented and experienced operators will be both attracted to the call-centre and to stay on longer. Also, since call time is not a critical success factor in CC1, extra resources can be committed in real time to decomposing complex problems. The option exists for CC1 agents to consign to 2nd tier experts but the goal to reduce referrals encourages resolution within the call-centre.

Problems of uncertainty come about through a lack of factual information. CC1 recognises the high proportion of problem types which fall into this category and have developed processes to maintain up-to-date electronic and paper based information sources. These are designed and populated by experts (scientists) so that callers with knowledge problems of ‘uncertainty’ are generally able to be quickly satisfied. Development of intellectual capabilities within CC1 to predict, infer, estimate and learn (as part of the training strategy) assists in the management of uncertainty (Zack, 1998). CC2 has a similar strategy for maintenance of electronic information.
systems (also populated by experts), but does not replicate this information on the Internet. The IVR system also contributes to the efficiency of CC2 since it streamlines calls directly to functional experts who, through their experience in dealing with specific business problems, are able to recall factual details quite independent of the electronic systems.

Rich interactive conversation is the key capability in management of ambiguity according to Zack (1998). CC1 have addressed this in their strategy of providing ample time for call-centre operators to discuss the problem with the caller and to attempt to reframe the problem into a situation that is more meaningful. The agent is able to repeat several cycles of interpretation and explanation until either the problem becomes resolvable (complex or uncertain), or is consigned to an appropriate scientist whose education and experience provide the skills to solve such problems. CC2 agents do not have the time to perform this type of dialogue and the consignment policy of postponing it to resolution by off-line research does not allow reframing, interpretation and explanation. Hence the only likely outcome for CC2 is consignment to tier 2 experts or abandonment by the caller.

The multiple meanings and interpretations which are characteristic of problems of equivocality require negotiation to converge on one meaning (Zack, 1998). With its policy of generous time allocation for agent dialogue with callers combined with capable staff, CC1 is well placed to resolve such problems. The knowledge strategy employed is not one of access to information, but rather one of process which provides the capability to cycle interactive discussion, negotiation and interpretation until a resolution is achieved. The IVR system used in CC2 may become a liability with problems of equivocality since the confusion of meaning may even commence with the initial options presented to the caller. This would end in an incorrect referral to an agent who may have preconceived ideas on the context of the call. Once taken the options quickly become abandonment or referral to tier 2.

CC1 has a goal to achieve 80% call-centre self sufficiency. The reporting and analysis of consigned calls serves as a trigger to identify strategies to reduce them. Past strategies have included requests for fact sheets, briefings by specialists and incorporation into training sessions. They also have sufficient redundancy in their resources to maintain a grade of service which is interpreted as zero abandoned calls. In times of high load due to staff illness or significant event, calls can be lost. These lost calls are not analysed due to the infrequent occurrence of such events. CC2 has a complex call routing system which attempts to locate local available resources and progressively skips to the next available agent. It is also supported by an IVR system to vertically stream callers into functional pools based on the business need. In this process, many calls are abandoned. Reporting in CC2 includes (by business function) total number of calls, number of referrals on beyond call-centre, proportion settled at advice and the percentage of all calls sampled for quality monitoring. The analysis of this data is primarily used to identify division of business function and the proportion of effort directed to this. It is also used to pre-empt future client needs and educational/promotional requirements.

Within both call-centres, the majority of the problem-types fall within the uncertainty/complexity column as listed in Table 2. This means knowledge strategies based on codified knowledge sources allow agents to quickly spiral in on a viable response set. The effort put into development of fact sheets and databases serves this requirement well since uncertainty is removed through access to current knowledge, while complexity is reduced through online searching and supported by access to experts via referral. CC2 however has a significant proportion of callers whose problems fall in the ambiguity/equivocality column. These generally emerge through the IVR system as a complaint and are managed by the more experienced team members. Such calls tend to take much longer to resolve and involve either referral to experts or are managed off line due to requirements for further research. The continuous payoff assessment by callers for these problem types generally demands much more resource allocation since the problems often have a personal/corporate financial consequence for the caller.

Neither of the call-centres studied employ a knowledge strategy based on any theoretical framework. They have evolved due to the current business drivers and continue to develop based on the historically bureaucratic organisational structure designed to deal with complexity (Zack, 1998). However, the process of participation of this study indicates each organisation is prepared to develop a capability to handle a broader set of knowledge problems. An analysis of the impact of current strategies identifies the gaps that need to be addressed if the model proposed applies and highlights the general practice of resolution of complex/uncertain problem types by the call-centre agent and a referral system for those aligning with Zack’s ambiguous/equivocal types.

CONCLUSION

Zack’s (1998) four-knowledge problem model provides a powerful lens with which to analyse knowledge-based management strategy within a call-centre. The efficiency principles being followed in the contemporary public sector will apply further pressure on call-centres to address all problem types, including ambiguity and
equivocality, both of which are currently handled predominantly by consignment in both CC1 and CC2. This gap, and the continual performance improvement imperative, would be assisted by developing capability to dynamically move knowledge to where it is needed, between the call-centres and rest of the agency.

This study found that CC2 is less able to manage problems of complexity causing them to consign more calls to more expensive knowledge resources. CC2’s drive for efficiency is working from their group point of view but the organisation’s more valuable knowledge resources are being used more frequently leading to an overall higher cost of service. By more closely managing the service from a knowledge self-sufficiency viewpoint, overall cost of this service could be reduced within the organisation. For example, extending the time allowed for resolution, improving the knowledge resources available, better training in the technical areas and information literacy skills (i.e. to improve their search capabilities) and developing better internal processes for handling problems of complexity would all affect this call-centre’s performance. Such a rebalancing of workforce and technical strategies could not only improve efficiency of the call-centre function but also improve effectiveness leading to better service quality.

In order to more closely study the management of these calls, the researchers have sampled recorded calls over a period and will be examining these in detail. This will allow closer scrutiny of the knowledge problem types experienced by the agents and their specific handling of these knowledge problems. The results will be presented at the conference.

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