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Groupware Products: Facilitating Knowledge Sharing in Organisations

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0. Abstract

Email has grown over the past decade to become the de facto communication form for business. However it has limitations in respect of knowledge creation, which is a strategic competitive weapon for all organisations.

Groupware products are an extension of Email, that offer improved flexibility to knowledge management and creation within an organisation. They enable distinct groups in different geographical locations to share knowledge and work collaboratively. The culture of an organisation and the nature of its knowledge must be addressed in order to successfully develop and implement Groupware.

The aim of the research project is to develop a methodology that is consistent with organisational culture, organisational knowledge and that leverages technology to best implement Groupware in an organisation.

The initial research is based on the use of Petrie nets and graph theory models in management science.

1. Research Objectives.

To develop a methodology for the effective implementation of Groupware as an agent that enables knowledge sharing in organisations.

Research Questions

1. How can Groupware be evaluated as an agent for knowledge creation within an organisation ?.

2. What metrics can be used to measure the effectiveness of Groupware ?

2. Organisational Culture

Cultural differences in organisations determine how information flows, how ideas are developed and decisions made, all processes that Groupware hope to enable. As Schein (1992) states, to know what goes on within an organisation we must have an understanding of its culture. The meaning of Culture as defined

by Schein (1992) is to see the combined learning of the organisation that is the emotions, behaviour and intellect of its members as a functional unit. Gallagher (2003) states that it is your operations and not your products and services that define who you are and what your culture is. By mapping operations, we can evaluate many aspects of an organisational culture. Gallagher (2003) also links the concept of internal customers to the idea of business culture, the example of South West Airlines that proudly states that "the customer comes second", its employees being first.

Organisational Knowledge

An organisation's competitive strategy must be driven by its knowledge management strategy (Argyris 2002). Groupware has the potential to play a major role in the knowledge management strategy. The information currently held within email systems is often less explicit than the information contained within more structured data repositories such as databases. Polanyi (1996) outlined the concept of explicit and tacit knowledge that is part of every individual and organisation. Groupware can be used to manage organisational knowledge that is not currently managed. Nonaka & Takeuchi (1995) expanded on organisational knowledge theory stating that organisations can not create knowledge without individuals. Groupware is the application that can best link the individual to the organisation.

Technology

Groupware can be viewed as a technological development of email. The technology enables the speed, reliability and veracity of this form of communication. The relentless technological developments will have a huge impact on how Groupware effects organisations. Kluge et al (2002) regard many IT solutions as 'push' solutions; but, knowledge is not like other assets in an organisation and 'pull' solutions are more suitable where knowledge is concerned. The individual must accept the application and the concept of sharing. This again goes back to idea of perceiving colleagues as internal customers. Decision Support systems (DSS) have achieved the aims of providing a platform for decision makers based on 'hard' data (Marakas 1998). Groupware applications aim to achieve a similar status for the less tangible knowledge within an organisation.

4. Methodology

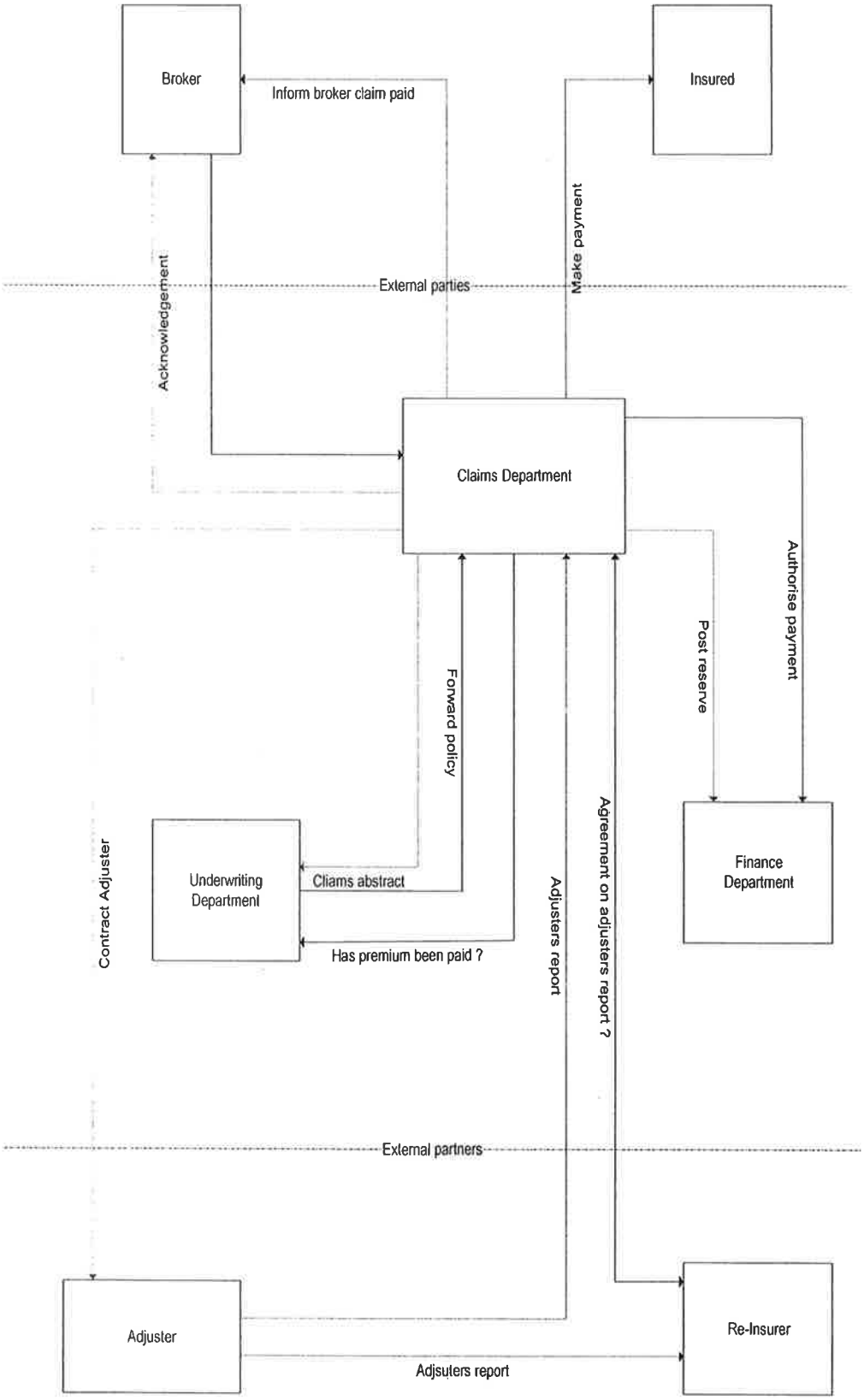
This research commences with a Case Study to illustrate how to successfully design a Groupware application.

The claims process was selected because this has a finite beginning and end as well as interaction with many parties. Typically a claim is lodged by the Insured, internal interactions take place and the claim is finally paid. Traditional techniques used to map such processes fail to take into account the layers of interaction and information that is exchanged as part of the interactions. Significant amounts of management data are lost by not using Groupware in such circumstances: the loss of knowledge exchange, decision-making ability and awareness of the complex series of tasks involved are just a few of the missed opportunities. Groupware applications are best suited to processes that involve multiple parties and a number of stages each with decision making/data analysis elements. We set out to develop a methodology that harnesses the features of Groupware (e.g.) interaction, flexible data typing, ubiquitous client software, workflow elements and user-friendly interfaces. Groupware is designed as a tool to enable Group Work. No business process can be viewed as an isolated activity. All processes involve multiple parties and databases, with many interdependencies with other business processes.

However, Groupware applications can be troublesome to develop and implement, they must take into account the many interactions that take place during any business process level of knowledge required to complete the tasks effectively.

Claims Process I

To build the case study, we interviewed members of the Claims department in order to analyse the task sufficiently. This identified a detailed list of the various actions that are carried out as part of the claims process. These tasks were listed initially as a series of steps. However, in the real world, many processes have a large non-sequential element (c.f.) Figure 1. This diagrammatically shows the steps within the process but does not adequately represent the non-sequential, interactive, complex communications aspects of the process. This traditional way of representing business processes as part of a systems analysis approach has proven to be unsuccessful in many cases. We need to look at another paradigm, a new way of approaching the problem and develop a new way to diagrammatically represent the process. This paradigm needs to be able to represent the complex nature of many business processes that often, at the outset, seem straightforward and simple.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Adjusters report
Agreement on adjusters report ?
Finance Department
External partners
Adjuster
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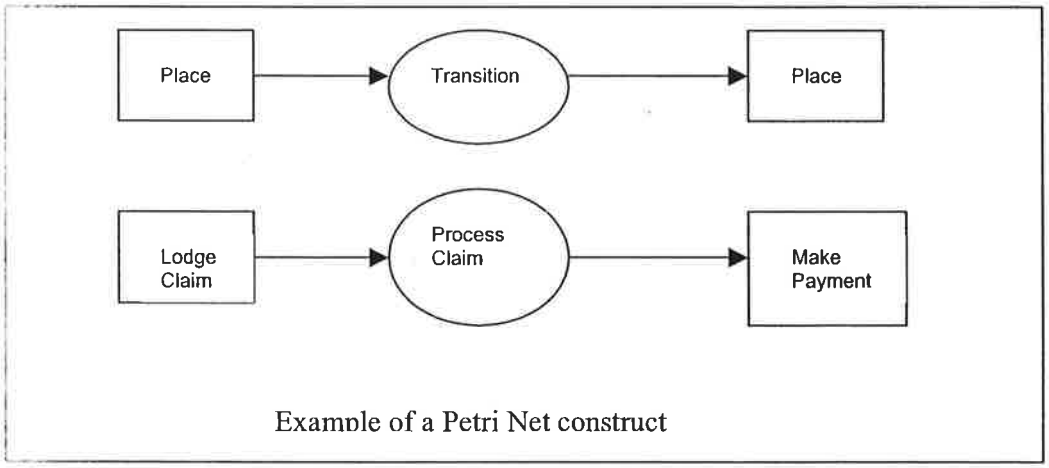
Re-Insurer

Petri-Net Models

The Petri Net methodology was chosen as the preferred tool to use next. Petri Nets are used to model procedures, organizations, and devices where regulated flows, in particular information flows, play a role.

Computer programs can be generated directly from the Petrie net description of a process.

We have chosen the place/transition Petrie Net methodology. The graphical notation uses circles for places and rectangles for transitions. Generally a place represents an object storage, and a transition symbolizes an operation that removes objects (tokens) from its predecessor places and inserts objects in its successor places.



Example of a Petri Net construct

Figure 2 is a simple representation of the process and it demonstrates the interactions which take place. The limitations are evident in that the problem is not fully represented with the multi-faceted interactions, both internal and external.

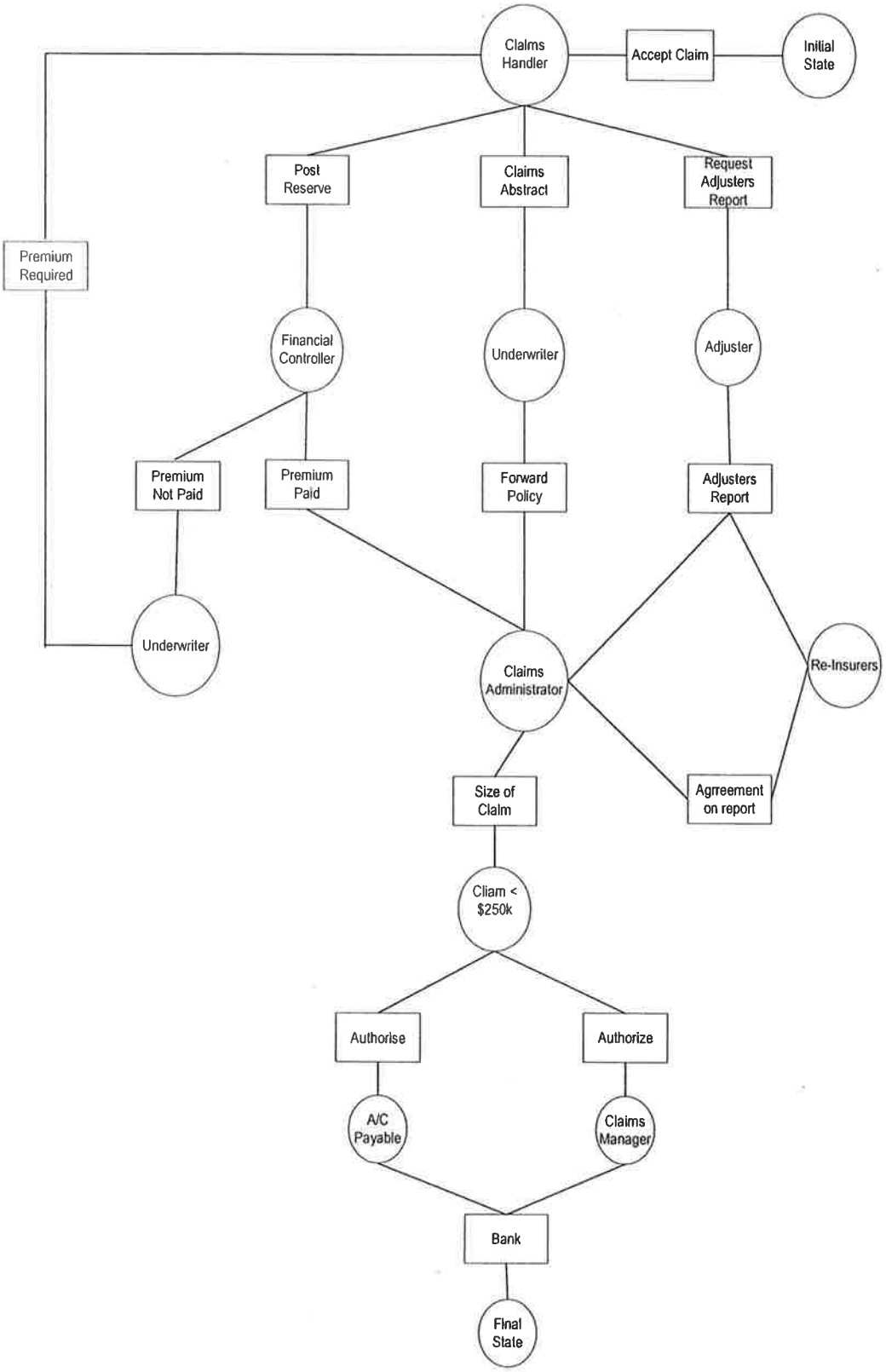


Figure 2. First representation using a Petri Net

Next we increase the number of parties and linkages (Figure 3.). The diagram now becomes unwieldy but succeeds in identifying important aspects such as the central role which the Claims Administrator plays in the process. He/She is central to the efficient completion of the task. We must ensure that the tasks for which the Claims Administrator is responsible are adequately addressed in our model. We have also added the data elements of the process; these are extremely important as it highlights where the information for each task is stored. There are a number of data elements:

1. **Claims Data.** Information collected as part of the claim submission. (A traditional form of data management.)
2. **Insured Data.** Information collected on the Insured (Client). (A traditional form of data management.)
3. **Claims Procedures.** Information relating to how the claim is processed within the organization, the interactions with other departments, the knowledge imparted during each step, how decisions are arrived at and who is involved in the decision making process.
4. **Financial Controls.** This information sets out how financial decisions are made (e.g.) claim payment and setting aside a reserve.
5. **Underwriting Procedures.** Information similar to the Claim Procedures, this sets out the steps, interactions and layers of authority within the process.

Groupware applications should be governed as much by the interactions and tasks that are part of the process as the traditional data elements that are updated during each step. The complex interactions at each step are as important as the data stored on the Claim details and Insured details such as policy type, claim amount, location, type of claim, premium paid etc. - attributes normally associated with DBMS (DataBase Management Systems). This traditional form of data management has proven its worth to business and the analysis of the information within this data has improved business decisions, reporting and product development. Decision Support systems (DSS) have been developed to manage and model data of a more structured (or semi structured) nature. The information we are most interested in is of an unstructured nature. However the data within the DBMS remains important because they are the hard facts upon which decisions and insights are based.

One of the main advantages of using Groupware products is that they help us identify the knowledge used to make decisions as part of business processes. The knowledge used to inform decisions, interpret data and arrive at conclusions is as much a part of these processes as those that appear higher up the organizational hierarchy. The often quoted remark from the

Chief Executive of Hewlett Packard that "If only we could know what we know" succinctly a flaw in many organizations. Groupware with a successful design and implementation can exploit the interactions and interpretation of information (both structured & unstructured).

But Groupware has failed to deliver on this promise in many cases. We feel that this failure has been mainly down to the methodology used to design the applications. We will endeavour to develop this methodology from the initial model outlined using the Petri-Net tool.

Claims Process II

Let us return to the Claims process. As previously described, the process consists of "traditional data elements" contained in the Claim Details & Insured Details entries. However, let us now add the "Groupware data elements" such as the interactions between parties, the reference material required for decision making and the controls in place for effective decision making. We can see from this that Groupware can offer an added dimension. It can capture the knowledge sharing which takes place as procedures, controls and decisions are dynamically updated. Our Petri Net based methodology seeks to plot all of the interactions between parties, control and procedure references as well as updating links (what we have termed "traditional data elements"). At first sight, this representation appears to be confused but if we analyze the two types of data elements separately, we begin to see the role which Groupware can play. We can see that for every action taken, either a "traditional data item" or a "Groupware data item" is referenced or updated with the pertinent information.

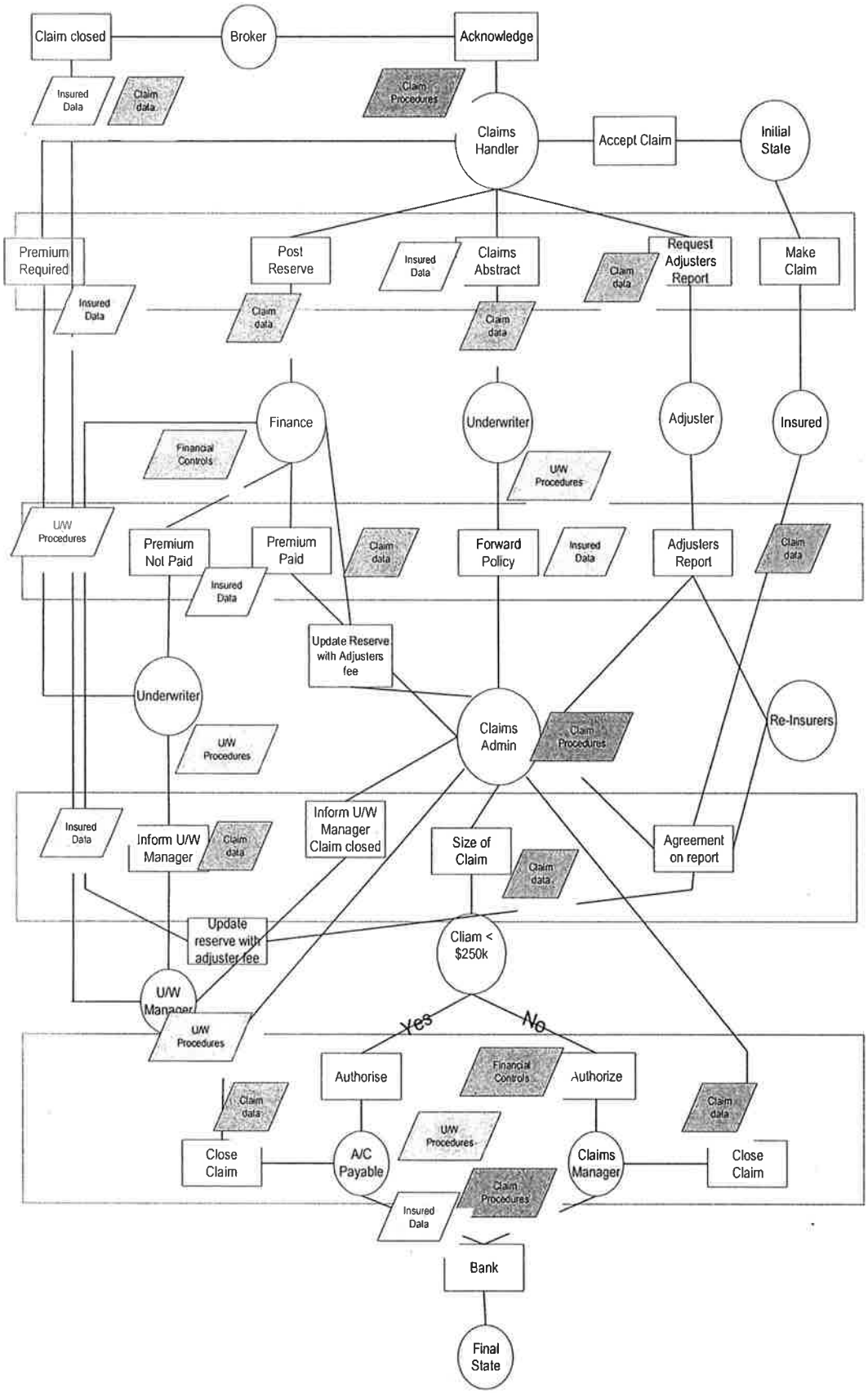


Figure 3. Complex interactions and data elements

5. Conclusions

The research so far has yielded a wealth of information through the case study approach. This information has endorsed many of the points made in current literature on organisational culture, organisational knowledge and how Groupware as a technology can be used to improve processes and not replace them with technological processes (Smith 2000). The Petri Net approach has proven to be a powerful tool in representing processes diagrammatically and highlighting important interactions within a business process. We feel the idea of information redundancy (Nonaka 1995) could go a long way towards achieving the goals of sharing and knowledge creation. Petri Nets can help in identifying how this information redundancy can be achieved.

Decision Support systems (DSS) have delivered important, accurate ,timely information to organisations to support both strategic and operational decision making. Groupware is ideally placed to add another dimension by capturing what we have called 'Groupware data elements' i.e. the information garnered and acted upon as part of processes, procedures and controls. The organisational knowledge which is contained within these functions is difficult to manage but the nature of how Groupware permeates an organisation lends itself to capturing this knowledge in a manageable form. The trick will be to implement this technology by taking into account current organizational culture and further developing the methodology.

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Appendix A

Figure 1. Implementing Groupware as a Knowledge Creation application