Info*Warder: Group Support Software for Tackling the Ownership and Political Aspects of Information Systems Project Proposals

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Abstract
It is well known that information systems development projects can be and often are the subject of political dispute within organizations. Indeed many project failures are caused not by technical problems but rather organizational ones. This paper briefly describes a theoretical model of the ownership and political issues surrounding information systems development and then, in more detail, a group support software package called Info*Warder that is being developed to try to identify in which areas ownership and political difficulties might surface at the project proposal stage.

1. Introduction
That organizational politics is an aspect of information systems development has been recognized for a considerable time [1], [2], [3], [4]. However it is still very much a topic of current research concern (e.g. [5], [6], [7], [8], [9]). Indeed Strassmann [10] goes so far as to say:
“…[the term] “politics” … describes, perhaps more aptly than any other, what information management is mostly about.”
Walsham [11] concurs:
“Information systems are implicated in major changes in work and work roles, on issues such as centralization and decentralization of control, on the relationships between different groups within organizations, and on aspects such as surveillance and individual freedom of action. Divergent interests and perspectives are normally present in such contexts, and thus information systems are arguably one of the key areas for political action in contemporary organizations.”

In discussing commonly held myths about information systems development Hirschheim and Newman [12] note, among other points, that user involvement and the drive for integration that are often present in information systems development are both sources of conflict because such developments undermine existing commitments and power bases. Such conflicts can cause expensive system development failures [13].

Despite this recognition there are few if any techniques available for dealing with ownership and political issues related to information systems. Structured development methodologies typically provide little help even if they acknowledge that ownership and politics can be an issue. For example, in his 660 page book discussing Information Engineering as an approach to strategic information systems development, Finkelstein [14] does not even mention ownership or politics at all. “Soft” methodologies such as SSM [15], [16], [17] do acknowledge the existence of such issues but nevertheless the guidance and support provided for detecting and dealing with them is still rather thin.

A number of authors have developed models that attempt to capture and represent the political aspects of information systems. For example,
[18] describes the interrelationship between stakeholders using a “web” model based on resource dependency theory. But again, there is little by way of technique for determining the sources of political trouble and the implications of this model for the practice of system development are unclear.

It is a fundamental premise in this paper that to successfully tackle sensitive political issues related to information systems development requires advance knowledge of their potential occurrence. Forewarned is fore-armed, and the more likely it is that productive, proactive strategies can be designed to avoid a possible disaster. The intent of the Info*Warder software described below is limited in that it only attempts to determine if, and about what, such conflict might be ignited. I do not, at this stage, seriously tackle the wider question of what to do when potential political problems are indicated.

In attempting to come to grips with the “why” of politics in information systems development, the author has developed a model using the concept of “information wards”. As this model forms the theoretical foundation of the Info*Warder software, a brief introduction to it is given below.

2. The Information Ward Model

The “information ward” model on which the software described in this paper is based is described in detail elsewhere [19], [20]. However, in order to orient the reader for what follows, an abbreviated discussion is presented below.

The basis of the information ward model is the idea that individuals and/or groups (called “players”) in an organization, who work with subsets of the data holding and business processes operated by their business, will feel some ownership over those assets. These will be perceived by each player to be “their” part of the business. Ownership and the resulting control of business data and processes can, of course, contribute to organizational power and influence and herein lies their importance.

It is argued in [19] that a coarse distinction can be made regarding player ownership of business data and processes. This distinction is based on the reaction of a player to a threat of takeover of some business data or process belonging to them. Some takeover threats to owned business data or processes will be worth resisting, others not. Resistance is argued to occur when takeover is perceived to mean a significant reduction in the organizational power of the threatened player, and may take the form of either legitimate or illegitimate activity. On the basis of this argument we draw a diagram in which all of the business data and processes of the organization are shown in a rectangular area. That which is owned by a player (or, more precisely, which the player perceives they own) is shown as a subset (ellipse) and is called their “information ward” or “IW”. That for which the player will resist takeover or actively pursue, using legitimate or illegitimate political methods as necessary, is called their “political information ward” or “PIW” and is of course a subset of their information ward. See Figure 1.

![Figure 1: Information wards and political information wards](image)

Ownership, when it is applied to data, especially, is a difficult concept (Wigan, 1992). It is important to note that the kind of ownership being discussed here is what might be best termed the “meta” level. That is, we are interested in who has control over data definitions, and the design of business processes rather than their detailed maintenance or operation. The power to control change in this meta-level sense belongs to the real owner of the data or business process at stake. Another important aspect of the ownership of concern in this paper is that of accessibility. Who controls access to, or the release of, details about business processes and data? In what follows we assume that the “owner” of a process or data has control over it in both of these senses.

Because an information system deals with business data and processes it too can be drawn on an information ward diagram. It is argued that if the scope of the information system overlaps the PIW of a player then that player will attempt to gain ownership or at least effective control of
the information system and/or its development. See Figure 2.

![Information wards and an information system](image)

**Figure 2: Information wards and an information system**

Overlapping PIWs, or a large IS scope overlapping several distinct PIWs are a potential source of inter-player conflict and it is this potential for conflict that the Info*Warder software seeks to help surface and help resolve conflict before a proposed project gets seriously underway.

### 3. The Info*Warder Software

The central function of the Info*Warder software is to allow representatives of particular players to make ownership claims over business processes and data on behalf of their group. The term “players” is not, however, used in the software since it is not in common usage and carries a possible prejudicial overtone. It has been replaced in the Info*Warder software by the more conventional “stakeholder”. After representatives have made their claims on behalf of their respective stakeholders, an assessment of potential areas of conflict can be made.

There are several aspects to the software. In brief, these are:

- Creating and deleting/hiding stakeholders and their representatives
- Creating and deleting/hiding the list of business processes and/or data to be discussed
- Ownership claims by stakeholder representative(s) to business processes and/or data on behalf of their own stakeholder group
- Allocation by representatives of ownership rights to business processes and/or data for stakeholder groups other than their own
- Comparison of ownership claims and allocations
- Messaging facilities
- Output of results.

However, before discussing each of these further it is necessary to briefly describe the environment in which the Info*Warder software runs.

The product is designed to run over a local area network of laptop or desktop personal computers (running Windows 95 or Windows 3.11), and is a client/server application. One machine in the network runs the server process which controls access to the Info*Warder database and provides data in response to requests from the various clients. Each machine on the LAN can run one (or more, but not usually) clients.

### 3.1 Ownership Claims and Allocations

The central function of the Info*Warder software is to permit ownership claims by stakeholder representatives to the business processes and/or data under discussion. Before describing this detail it is important to note that the system distinguishes between stakeholders and their representatives. One stakeholder can have one or more representatives but each representative belongs to exactly one stakeholder.

Assume that the list of items to be discussed - business processes and data - has previously been defined, as have the relevant stakeholders and their representative(s). Ownership claims can then be made by the stakeholder representatives over the various items. Info*Warder supports three levels of “claim”:

- **Exclusive** (i.e. this item is, or should be, under the exclusive control of the stakeholder for which the claim is made). This is taken to mean that it is in the PIW of the relevant stakeholder.
- **Non-exclusive** (i.e. this item is, or should be, under the control of the stakeholder concerned, but control of it is negotiable). This is taken to mean that it is in the IW of the relevant stakeholder.
- **No claim** (i.e. this item is not, or should not be, owned/controlled by the stakeholder concerned).

Also supported is a “decomposition” option. This means that the item concerned is, or should be, partly but not wholly owned by the stakeholder. It needs to be broken down into
more detail before meaningful claim(s) can be made. The ownership claim screen is shown in Figure 3.

In the Figure, the columns to the right of the “Processes/Data Items” list are for the exclusive, non-exclusive, no claim, and decomposition options respectively. For example, in Figure 3 the Administration stakeholder has no claim over Audio-visual services but has an exclusive claim over Funds allocation. Also note that comments can be entered against each claim. These can be public (i.e. viewable by any representative in the group, including those of other stakeholders) or private (i.e. viewable only by representatives of the same stakeholder group as the originator of the comment). The totality of the “exclusive” claims is this representative’s view of the PIW of their stakeholder, and that of the “non-exclusive” plus “exclusive” claims is the IW of their stakeholder.

Representatives can not only make claims for the stakeholder group to which they belong but can also express their opinion on the ownership rights of the other stakeholder groups who are involved. This is done in the same way, and on an identical screen, to that shown in Figure 3. The only variation is that the stakeholder group for which ownership is being allocated is different from that of the representative doing the allocating. The purpose of this is to gain an overall group view of the ownership rights of any particular stakeholder, rather than just limiting it to their own unique perspective. Such an overall view can indicate the degree to which consensus does, or does not, exist among the participants within the group and aid in highlighting any areas of potential difficulty.

3.2 Multiple Representatives for a Stakeholder

As noted above, a stakeholder may have one or more representatives within the group. Each of these representatives will make claims (as they see is appropriate) on behalf of their stakeholder. The Info*Warder software supports such
individual representative claims, but it also prevents these individual representative views of a stakeholder’s rights from being viewable by representatives of other stakeholders. The reasoning here is that if the representatives of a particular stakeholder differ in a significant way over what their stakeholder’s claims should be then they would want the difference of opinion kept within the group (and discussed or debated privately) rather than being open to inspection by outsiders who might then be in a position to take advantage of that knowledge.

Allowing for differences of opinion by the representatives of a particular stakeholder, but keeping these within the stakeholder group, raises the question of how to construct the overall stakeholder claim from those of its individual representatives. At present we neglect differences of weight between representatives within the stakeholder group and there are, then, three basic possibilities:

- **Maximum.** That is, for a particular process/data item, the stakeholder claim is equal to the “highest” (exclusive > non-exclusive > no claim > decomposition) of the individual representative claims. For example, if a stakeholder has three representatives and, for a particular list item, two make a non-exclusive claim and one makes an exclusive claim then the overall stakeholder claim to that item is an exclusive one. This is termed the “maximum priority union” of the individual representative claims.

- **Average.** That is, for a particular process/data item, the stakeholder claim is equal to the rounded average of the individual representative claims, discounting decomposition “claims”. Within the Info*Warder software the different levels of claim are represented numerically as 0 (exclusive), 1 (non-exclusive), 2 (no claim) and 3 (decompose). The stakeholder claim is then the numeric average of these across all representatives, rounded to the nearest integer. For obvious reasons, this is called the “average priority union”.

- **Minimum.** That is, for a particular process/data item, the stakeholder claim is equal to the lowest of the individual representative claims. This, however, is not likely to be a useful option in practice.

Presently the option implemented in the Info*Warder software is “maximum” (and it is called simply “priority union”) but an option to choose “average” instead may be included in a later version. Of course only the consolidated stakeholder claim - the priority union - is visible outside the stakeholder group concerned.

### 3.3 Inspecting Claims

Representatives within the group as a whole not only need to make claims on behalf of their various stakeholders but also need to view the claims made by others in order to begin the process of negotiation and hopefully consensus building. The Info*Warder software provides representatives with the ability to view the claims of stakeholders other than their own, but they only see the priority union (see above) for that stakeholder rather than the underlying claims of the individual representatives. The screen for this is very similar to that of Figure 3, except that it is read only and the private commentary internal to the selected stakeholder group is, of course, not displayed.

It is also necessary for an individual representative within a stakeholder group to be able to see and compare the claims of the other representatives within the group. Info*Warder supports this too.

### 3.4 Comparing Claims

In addition to permitting a representative to make and view their own allocations for other stakeholders, Info*Warder allows comparison of the external stakeholder’s claim (i.e. the priority union of the relevant representatives) with what the representative said him/herself. For example, a representative A may have allocated ownership for a stakeholder not their own (say $\alpha$) and may wish to compare what s/he said with $\alpha$‘s own claims. The “Compare” facility in Info*Warder provides this direct comparison.

### 3.5 Messaging Facilities

Recognizing that claims to ownership of business processes and data is likely to be the source of considerable discussion and debate both across and within stakeholder groups, Info*Warder provides flexible messaging facilities. While the capability exists to attach a public and private commentary to individual claims, the messaging window provides a more general communication method that is not
necessarily tied to a particular claim. Additionally, with the public and private commentaries the viewing audience is pre-defined whereas using the message window allows the representative sending the message to determine exactly who the recipients will be. A representative can send a message to any single or group of specific individuals, one or more complete stakeholder group(s), all representatives, or any mixture of these.

3.6 Stakeholders and Representatives

Dealing with the creation and deletion of stakeholders and their representatives turned out to be an interesting issue in the design of the Info*Warder software. The easiest solution would be to invest such authority in some kind of Info*Warder “superuser”. However, such a “superuser” would then necessarily have access to all of the data input into the Info*Warder system by all participants using it. Given that the system is intended to deal with potentially politically sensitive organizational issues, this easy “solution” was seen to constitute an unacceptable security risk for the participants and thus was rejected. Instead, the process described below was adopted.

When an Info*Warder client attaches to the server the user can log in as an existing representative (password controlled) or create a new stakeholder, along with the first representative for that stakeholder. However, creation of new representative(s) for an existing stakeholder can only be done by an existing representative of that stakeholder. In other words, anyone can create a new stakeholder group, and become the first representative of it. But, once created, a stakeholder group can only be added to - that is, new representatives created - by representatives already belonging to it.

Deletion of a representative can only be done by that representative him/herself. The disadvantage of this approach is that if a representative disappears from the group or organization for whatever reason then there is no way to remove their inputs/claims from the system. To deal with this the Info*Warder software provides the ability to “hide” a representative along with all of their inputs/claims. This removes their data from all of the screens and outputs of the Info*Warder system but does not delete anything from the underlying database. Hiding a representative requires consensus among all of the other representatives of the stakeholder group to which the one to be hidden belongs. Any individual representative of the stakeholder group, including the one who is hidden, can “unhide” a previously hidden representative.

Deletion of a stakeholder group can only be done by a representative of the group concerned and then only if there are no claims in the database by any other representative of that group. Deletion of the stakeholder group causes deletion of all of its representatives as well (including the one effecting the deletion). But now a similar difficulty to that described above for deletion of representatives appears. What if a stakeholder group should be deleted but none of its remaining representatives are around to delete it? The solution is also similar - the offending stakeholder group can be hidden instead. Hiding it requires a consensus across at least one representative from each of the remaining stakeholder groups in the system. But any representative from any stakeholder group (including a representative belonging to the hidden one) can “unhide” it.

Lastly, an existing representative can create a new stakeholder. However, if this is done then the representative is automatically removed from his/her existing stakeholder group (after an appropriate warning!) and allocated as the first and only representative of the new one. All extant claims and ownership allocations by this representative are also transferred from the old stakeholder group to the new one.

3.7 Processes/Data Items

Consistent with the principle that there must be no “superuser” in the Info*Warder software system in order to preserve its political acceptability, the list of processes and data items is managed in the following way:

- Any representative may add a process or data item to the existing list. Note, however, that a hidden representative cannot do such an addition without at first un-hiding him/herself.
- A process or data item can be deleted by any representative but only if there are not claims or allocated ownership rights attached to it. This includes claims or ownership rights allocated by hidden representatives or stakeholders. In such case, the process or data item concerned can only be hidden and not deleted (see below).
• A process or data item, along with all of its related claims, ownership allocations and comments can be hidden but this requires the agreement of at least one representative from each of the currently active (i.e. not hidden) stakeholder groups.

• Any representative (except hidden ones) can unhide a process or data item, which also unhides all of its associated claims, ownership allocations and comments.

Like hidden stakeholders and representatives, a list of hidden processes/data items can be displayed by the Info*Warder users.

3.8 Outputs

Info*Warder provides a number of outputs, mostly in the form of graphs. These are:

• The group view of the ownership rights of a particular stakeholder

• The group view of the ownership of a particular process/data item

• All stakeholder claims

• Conflicting claims (ordered by level of conflict)

3.8.1 Group View of Stakeholder Ownership. The axes of this graph are the process/data item list (horizontal) and number of representatives (vertical). It shows the ownership rights of the selected stakeholder according to the group as a whole. For each process/data item on the horizontal axis, the number of representatives who said that the selected stakeholder exclusively or non-exclusively owns that item is shown. Inputs from all representatives, from all stakeholder groups, are used in constructing the graph so this represents the group view of the ownership rights of the stakeholder concerned. The intent of this output is to indicate the level of consensus, or lack of it, within the group regarding the ownership rights of any particular stakeholder and to form the basis of discussion where disagreement is evident.

3.8.2 Group View of Process/Data Item. This graph serves a similar purpose to the previous one, but for a particular process/data item rather than a particular stakeholder. Consequently the horizontal axis shows the list of stakeholders and the graph itself shows, for each stakeholder, how many representatives in the group said that stakeholder has an ownership claim (exclusive or non-exclusive) over the relevant process/data item. Like the previous graph, this output is intended to indicate the level of group consensus, or lack of it, regarding the ownership of a particular process/data item.

3.8.3 All Stakeholder Claims. This output is in the form of a matrix. The process/data item list is shown as the vertical axis and the list of stakeholders forms the horizontal axis. Each cell in the matrix shows the claim (if any) by that stakeholder for that process/data item. Note that the claim shown in this output is the actual claim by that stakeholder, not the group view of their ownership rights to that process/data item. It therefore allows detailed comparison of claims by different stakeholder groups.

3.8.4 Conflicting Claims. This graph shows those processes/data items for which more than one stakeholder has made a claim. The processes/data items for which conflicting claims exist are shown in decreasing order of level of conflict. That is, they are ordered by:

1. Number of exclusive claims (descending), and then
2. Number of non-exclusive claims (descending).

For example, a process/data item with 2 exclusive claims against it and 1 non-exclusive claim will appear higher in the conflict graph than one with 1 exclusive claim and 4 non-exclusive claims against it.

4. Implications for Practice

Too often, scant attention is paid to potential organizational or political problems in information systems development efforts - until they arise. Then, like programming errors that are discovered later rather than earlier in the project life cycle, they can be increasingly difficult or even impossible to fix. The fundamental assumption behind the group support software described in this paper is the same as that in the programming errors case. Namely, the earlier the problem is recognized and tackled, the more likely it is that it can be solved, and at a reasonable cost. But to do this requires appropriate tools and techniques and the group support software described above represents a step in this direction.

Once the ownership and political “landscape” has been mapped out using the Info*Warder tool then
consideration can be given to how that landscape will affect the proposed development. Knowledge of conflicting claims, even without similar knowledge of hidden agendas that may be driving them, can form the starting point for negotiation and compromise designed to defuse or at least circumvent the trouble that might well otherwise ensue. On the other hand, if the landscape proves to be clear of significant conflict then the proposal may be tackled with some confidence that unforeseen political difficulties will not arise.

5. Conclusion

The Info*Warder software approach to the potentially divisive and politically charged issue of business process and data ownership is a “head on” one. It recognizes and accepts that such difficulties are the norm, not the exception, in information systems development and represents an initial step towards trying to design organizational IS solutions that work with rather than against the ownership and political concerns of involved stakeholders. To do this requires advance knowledge of where these difficulties will arise. Info*Warder tries to provide a vehicle for determining where potential conflict will occur before it breaks out in fact - the first requirement necessary for dealing successfully with it.

Further work currently being planned will involve taking the fully developed software into the organizational environment and determining how well it works in actual practice.

6. References


