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The Systems Engineering Tool Box

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"Give us the tools and we will finish the job"
Winston Churchill

Stakeholder Influence Map (SIM)

What is it and what does it do?

A Stakeholder Influence Map (SIM) is a derivative of the standard influence map. It is a simple tool for capturing the potential stakeholders of a system and the interactions/influences that exist between them.

Why do it?

Typically there will be a number of different people who have an interest in a particular system. Collectively these interested people are called stakeholders and can comprise:

- The customer or user
- People who operate the system
- General public and people affected directly or indirectly by the system's use
- People who regulate the system (government and government agencies etc.)
- System designers, builders, maintainers and disposers
- The system itself

Stakeholders frequently have views about a particular system that range from specific requirements through to objections about its existence or operation. Understanding these views is critical to good system design and the starting point in eliciting them is to identify the stakeholders who will express them. A Stakeholder Influence Map is a tool that can be used to identify, organize and document system stakeholders and the interactions that exist between them.

Furthermore, for any system there is potentially a large number of stakeholders/customers and in the ideal world we should wish to elicit and capture requirements from all these stakeholders/customers. Pragmatically, we are likely to neither have the time or money to do so and there need to be selective. The question becomes "which ones?" The Stakeholder Influence map provides a degree of focus and understanding to help identify the groups of stakeholders that we:

- MUST get requirements from;
- can IGNORE (but only this time and why!);
- SHOULD get requirements from.

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Where and when to use it?

A Stakeholder Influence Map should be constructed prior to undertaking any preliminary design work and before talking to the stakeholders. A piecemeal approach to gathering requirements is unprofessional and moreover can frustrate individual stakeholders if they are repeatedly canvased for their views.

Who does it?

An individual or team can undertake the construction of a Stakeholder Influence Map. In general, the outcome is more complete if a team performs the map construction. It is important to emphasise that the quality of the outcome is dependent upon the experience of team or individual.

How to do it?

The process for constructing a Stakeholder Influence Map comprises four steps:

Step 1: Brainstorm all potential stakeholders for the system of interest. A stakeholder is defined as anybody who comes into contact with, or has an interest with, or is affect by the system of interest at any point during its entire life cycle.

Step 2: Identify natural groups of stakeholders that have similar/common views or requirements. These groups should be given a collective name

Step 3: Using the stakeholder groups construct the Stakeholder Influence Map by identifying and documenting the influences between the various stakeholders.

Step 4: Review Stakeholder Influence Map to decide:

- Which groups of stakeholders MUST we get requirements from?
- Which groups of stakeholders can be ignored (this time and why!)
- Which group of stakeholders SHOULD we get requirements from

The Stakeholder Influence Map may also provide an understanding of the market context for the system leading to lobbying/sales and marketing strategy

Illustrative Examples

The following example concerns the development of a Stakeholder Influence Map for a robotic/autonomous lawn mower. This particular system will be able to mow a domestic lawn without any human intervention. This opens up a number of possibilities including night-time operation and frequent mowing over several hours (robotic/autonomous lawn mowers do not get bored and can easily take many hours to mow even a small lawn!). The purpose for conducting the analysis would be to determine the potential stakeholders and groupings of stakeholders who have similar requirements. By grouping the stakeholders offers the opportunity to reduce the effort in eliciting and capturing requirements through focus groups or customer

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clinics. It may also be possible to prioritise the groups again to reduce the effort in gathering requirements.

Step 1: Brainstorm all potential stakeholders

Figure 1 shows the outcome of a brainstorm of potential stakeholders on to sticky notes. A stakeholder is anybody who comes into contact with the System of interest or has an interest in it.

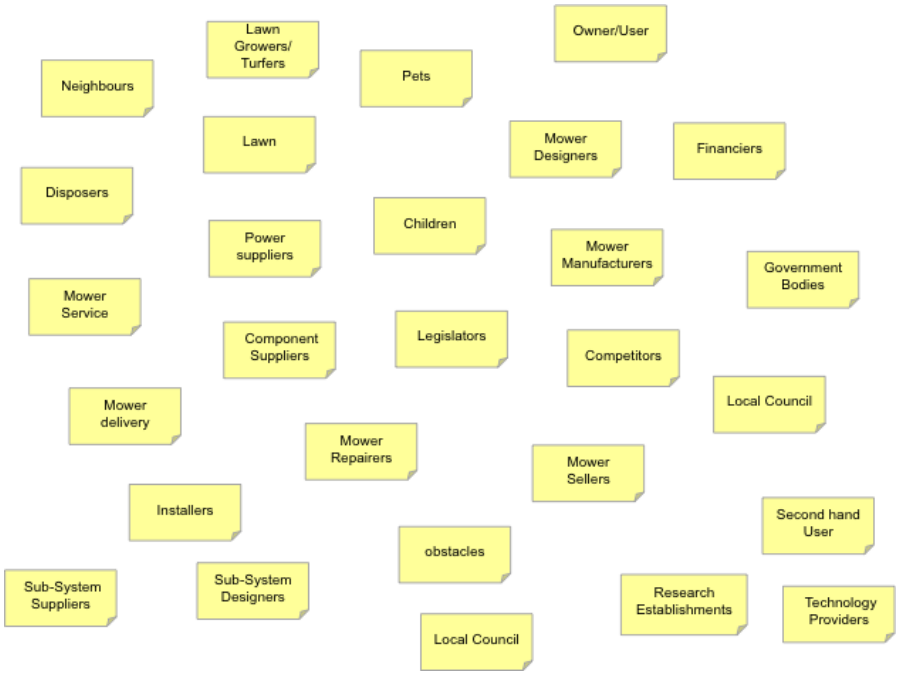

Figure 1: Sticky note brainstorm of potential robotic lawn mower stakeholders

In this particular case the brainstorm was facilitated hence there are no duplications[1].

Step 2: Identify natural groups of stakeholders

Figure 2 shows the outcome of grouping the various stakeholders found in step 1. The grouping is based on stakeholders that we believe have common or similar requirements. There is a danger, of course, that we group stakeholders that have differing requirements and by not eliciting these believe we have their needs and expectations when we do not. Best practice for gathering requirements includes some form of validation.

[1] There are several brainstorming approaches that can be used with a team. One is to let individuals conduct the own personal brainstorm and subsequently form a team brainstorm. This will result in duplications that have to be discussed and removed. The other approach is to use a facilitator to capture stakeholders as voiced by the team members.

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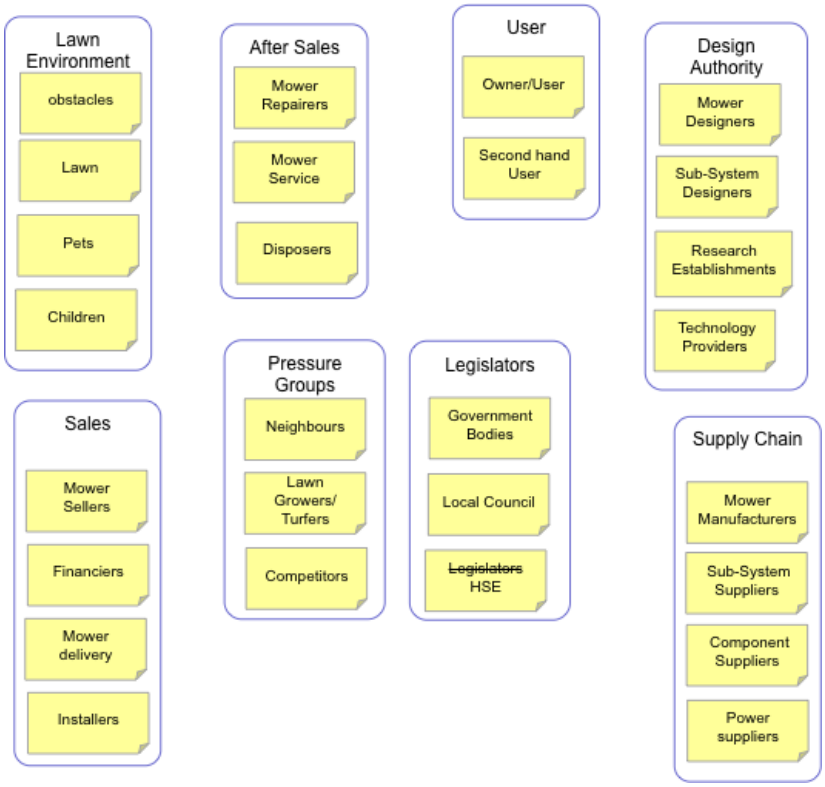

Figure 2: Grouping of potential stakeholders

The groups of stakeholders should be reviewed and a suitable name identified for that group as shown in Figure 2. If difficulty is experienced in determining a suitable name it is likely that the group is wrong and a new grouping should be considered. It can also be useful at this stage to consider missing stakeholders. In other words, review each group to see if any further stakeholders can be identified. For example Figure 3 shows a revised Figure 2 with the inclusion of additional stakeholders.

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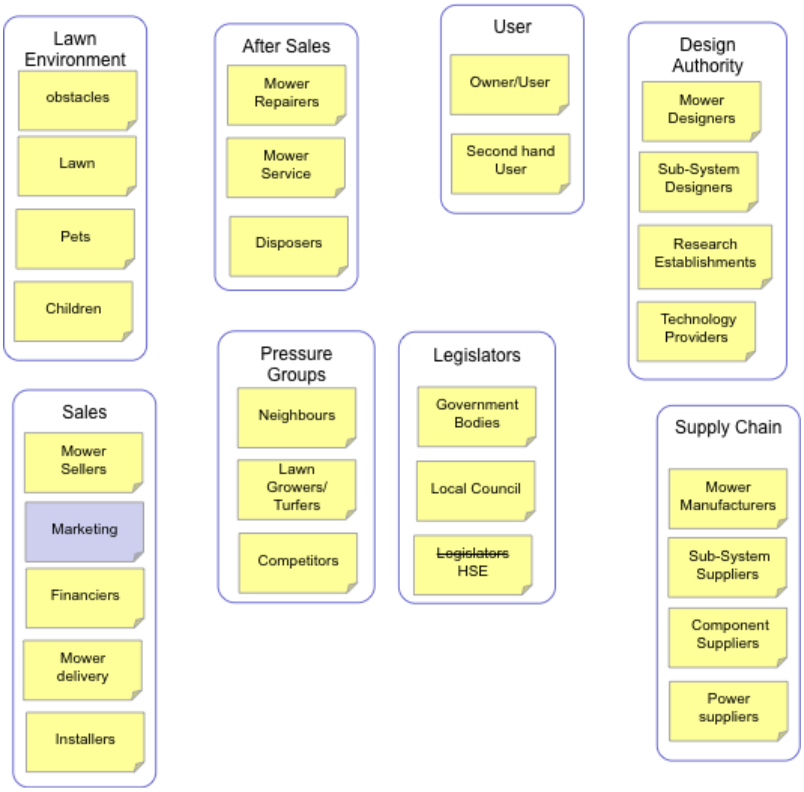

Figure 3: Revised Figure 2 with additional stakeholders

Step 3: Using the stakeholder groups construct the Stakeholder Influence Map

Figure 4 shows the completed Stakeholder Influence Map. It is a partial view since not all possible connections have been captured. It does, however, represent the understanding of the team in terms of the likely influences and interaction between the various stakeholder groups.

Purists, of influences maps would argue that only “influences” should be captured. Physical flows between groups of stakeholders should not be captured. In practice this is difficult and moreover, since we are attempting to capture the views of a team in terms of their common understanding of the situation. Therefore, if a flow between two groups of stakeholders is “physical” yet the team considers it useful to include – include it! It must be remembered that an Influence Map (stakeholder or otherwise) is a model - a representation - of reality for a purpose and like all models is wrong.

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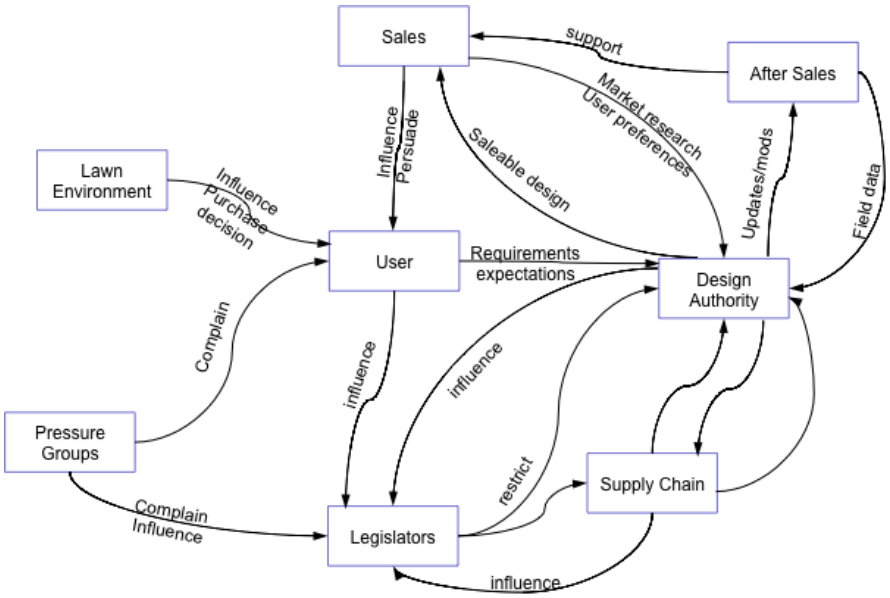

Figure 4: Stakeholder Influence Map

Step 4: Review Stakeholder Influence Map

The purpose of constructing a Stakeholder Influence Map is to manage the effort, cost and time in eliciting and capturing stakeholder requirements. There never is enough time to elicit requirements every stakeholder. Grouping stakeholders provides one mechanism to reduce the requirements gathering effort. It is also possible, dependent of course on the particular project and phase, to decided not to collect requirements from a particular group. This latter mechanism requires consideration of three possibilities:

- The first key question is “which groups of stakeholders MUST we get requirements from?”
- The second question is “which groups of stakeholders can be ignored? (but only this time and why!)”
- What should be left are stakeholders from whom we should collect requirements.

This simple assessment can dramatically reduce the effort in gathering requirements but one that is not without risk. In deciding if there are any groups for which we will not, at this point in time, collect requirement from, it is important to consider the risks the decision may pose. The magnitude/criticality of the risk is often dependent upon the project phase. Indeed, the early project phases, such as “bid/”no-bid” and “generate proposal” may have a lower risk that later phases like “design system”. It must also be remembered that we are deciding not to gather requirements at this point – there will come a point where we must.

To illustrate this consider the lawn-mower example and assume that these is a technology demonstration project that if successful will lead to the design of a production version. In this instance it was decided to collect requirements from:

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- The User: this would be a source of requirements that would be used by potential purchasers and therefore directly affect sales – they are likely order winners.
- The legislators and Pressure Groups: These would provide requirements that while not order winners must be met – they would be order qualifies (must haves like safety).
- The final group was “sales” since the system was unprecedented one of the key roles of Sales would be to successfully marketing the system.

It was decided NOT to collect requirements from:

- The Lawn Environment: this is a group of objects and artefacts that don’t really have requirements *per sa.* They must, however, be taken into account.
- The Supply Chain: Until some idea about potential solutions is know the supply chain requirement are likely to be high level statements like “easy to assemble”, “manufacturable”. Wait until more is understood about the problem before eliciting requirements from this group.
- After Sales: Again until some idea about potential solutions is available involving the After Sales stakeholder at this point may not be fruitful.
- The Design Authority: Once again this group would have more to say after potential solutions have been explored.

In this instance, there were no groups that fell into the third category. This is often the case and this category only becomes useful if there is insufficient funds or resources to gather requirements from first group. In such cases, we have to make decisions and these should be based on relative risk.

What Goes Wrong: The limitations of the Stakeholder Influence Map

Missing key stakeholders. It is possible, typically by not including appropriate personnel, to miss key stakeholders. Before running the session with a team to construct a Stakeholder Influence Map, I always “have a go” on my own! This means that I am prepared to ask about any unspoken stakeholders that I have considered and the team have not.

Grouping the Stakeholders. This is a common problem where what appears to be a sensible grouping of stakeholders turns out to be inappropriate – i.e. the group members have significantly differing requirements. This can be avoided by some simple but time-consuming (and therefore resource) activities:

1. Pretend to be the stakeholders and attempt to generate an educated guess of their requirements. This may show up where there is an inconsistent group.
2. Validate the grouping by allowing a review of the team’s Stakeholder Influence Map.
3. When gathering the requirements used a focus group approach comprising at least one representative of the stakeholder group.

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Assuming that the last Stakeholder Influence Map will do. For a particular organization it is likely that the Stakeholder Influence Maps will be very similar differing only in detail. In consequence people soon ask – "why do a new one, it's going to be the same at the last one!" This actually is a delicate problem since it will happen and people will consider the exercise a "waste of time" and either:

- Use the previous Stakeholder Influence Map – it then becomes more of a checklist and all thinking stops!
- Revert to previous approaches

What is critical here is people realising that the process is more important that the outcome. The fact we have spent an hour arriving at the same result as last time is good since it confirms that for this project the stakeholders are the same.

Success Criteria

The following list represents a set of criteria that have been found to be useful when constructing a Stakeholder Influence Map.

- Team size
  - For Systems between 4 and 8
  - For Sub Systems between 2 – 5
  - For Components 1
- Team constitution has expertise and experience in the system of interest but can (and perhaps should) include members with limited experience and expertise.
- Use an experience independent facilitator.
- Plan for one hour's effort.
- Define clearly what we are trying to do.

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