HMinfo case studies evaluation

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Introduction

The case study prototype was made public when the HMinfo Clearinghouse website was officially launched in November 2003. By September of 2004 there were 95 registered users, including Home Modification and Maintenance Service (HMMS) providers (63%), Occupational Therapists (12%), Home and Community Care providers (7%), Local Government Associations (7%), design students (5%), Consumer peaks (5%) and government authorities (3%). The breakdown of usage by professional discipline can be seen in Figure 1.

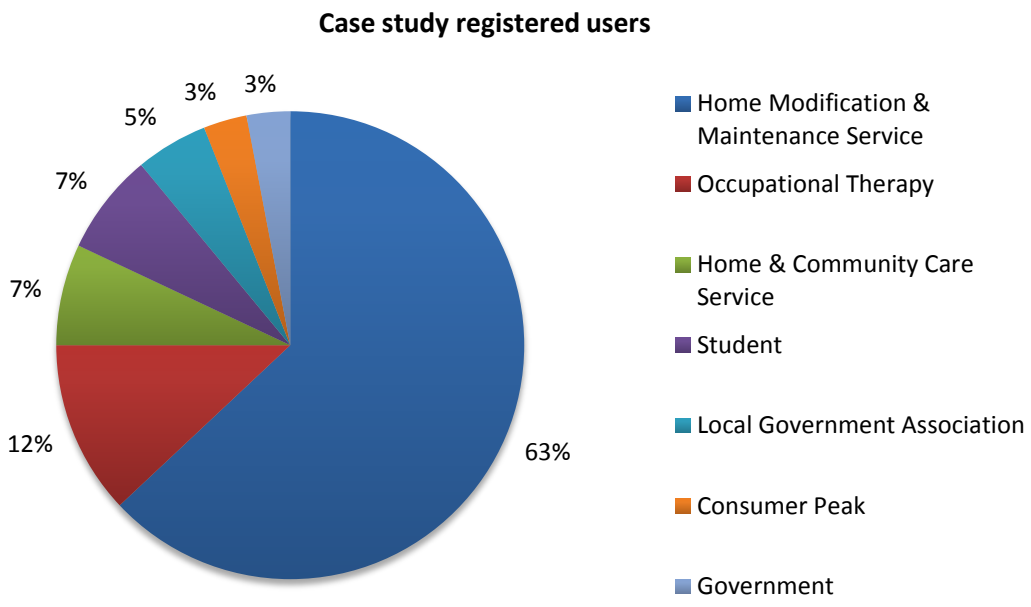

Figure 1. Distribution of HMinfo case registered users by professional grouping (Oct 02, 2003 - Dec 08, 2004)

Access to the case studies prototype does not require that users register, however only registered users can add cases. All data about registered users was obtained by analysis of the user profile, which was voluntarily entered online.

Web log analysis of performance

The WebSTAT page view1 logs were analysed in order to evaluate the case study usage patterns of registered case study users and visitors (non-registered users restricted to browsing). The page views web logs pertain to the whole of the HMinfo website of which the Case studies area is just a small component.

[1] WebSTAT is a statistical analysis program, it defines a “page view” simply as the number of times a page was displayed on a website. This count is incremented every time a visitor views or refreshes a page on a website that has the WebSTAT code tags on it'

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In total there were 10,157 page views specific to the Case studies section of the website when the user registration page views information was removed. This represents 40% (e.g., just under a half) of the total HMinfo website usage. The breakdown of the page view statistics is shown in Figure 2. Web log analysis indicates that the act of browsing cases accounts for the largest number of page views (i.e. it accounted for 27% of the total case study page views). Additionally, the page views of case components ranged from 4-12% of the case study total. It appears that the case studies users registered the highest number of page views for the general case components, followed by the human components and space components, The lowest number of page views were registered for the activity component. This implies that not all the users viewing cases were equally interested in all the case components. Viewing of the case reuse reports (104) was substantially less than the case components but this is unsurprising as not all of the cases in the case studies area currently contain this data. Also of note, is the fact that the number of page views for browsing is higher than those for submitting new cases.

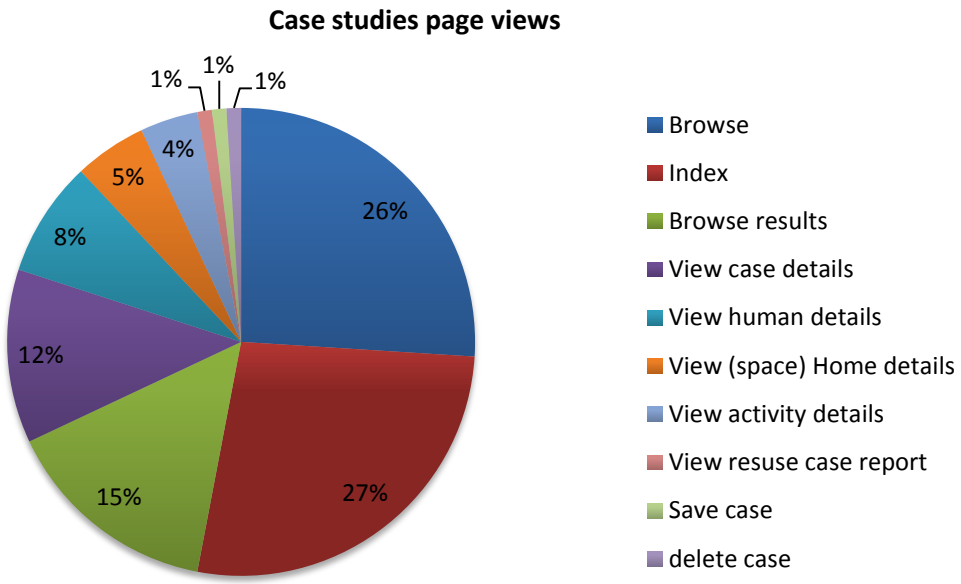

Figure 2. Breakdown of case study page views by page type and percentage of views (Oct 02, 2003 - Dec 08, 2004)

Despite this obvious trend, a number of cases appear to have been added (50) but subsequently deleted (49). The total number of case added equals those deleted, if the cases currently available as submitted by users is subtracted. Why this occurred is unclear, it may just reflect a means of active exploration of the websites functionality.

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Heuristic evaluation of online performance

A heuristic evaluation2 (Neilson, 1994) of the HMinfo Case studies was undertaken to get more information about the overall usability, intuitiveness and efficacy of the system and its interface. This small-scale heuristic evaluation was undertaken following the Web log analysis during the months of January and February, 2005. The evaluation involved six home modification practitioners in total. Half were experienced occupational therapists (3) working in a variety of settings and the other half were HMMS providers working within NSW. The purpose of the empirical evaluation was to explore the adequacy of the case study model for managing home modification information. However this was implicit not explicit as the evaluation examined participants reactions to online reasoning tasks. The emphasis was on exploration, so it was not a full-scale usability study. All participants were already familiar with the case studies area (i.e. were HMinfo users) and volunteered to participate. Participants were purposively sampled, in other words HMinfo users were generally emailed requesting participation in case studies evaluation. Only those who emailed back an interest in participating were then sent a survey. In this manner all six subjects across the two professions were recruited. Participation was entirely voluntary and participation was solely for the purpose of providing some feedback to determine the key issues so as to better understand the way some users perceive the overall usability of the Case studies prototype's. Each participant was given a specially developed HMinfo clearinghouse 'Case study Usability Assessment' questionnaire. The questionnaire was based on the format and contents prescribed for online usability evaluation by Commonwealth government web portal developers (McGovern, 2004).

Each participant was asked to provide information about their demographic profile; Internet experience and they were also asked to carry out two online tasks. The two tasks involved locating a case for reuse and submitting a new case. Tables 1-4, list the responses to the questionnaire provides information about demographics; Figure.2 provides information about prior internet familiarity; Figure.3 provides information about the task of locating a case and illustrates information pertaining to task and provides information about the task of submitting a new case.

[2] Problem analysis based on informal judgment or experience versus data manipulation.

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Table 1. Demographic information

Participants demographics	Occupational Therapists	HMM Service providers	Interpretation
What is your age group?	2 (21-30); 1 (31-60)	1 (21-30); 2 (31-60)	Both user groups are adults and the fact that the Occupational Therapists are marginally younger may be to do with the fact that those working in HMM services tend not to enter as a first job. The age difference may also mean that the younger users are more familiar with computational technology.
Gender	1 male and 2 female	1 male and 2 female	The fact that these are the same is unexpected as traditionally there is a gender difference with Occupational Therapists being predominantly female and those from a construction background predominantly male.
What is your highest level of education?	1 Post Graduate Certificate; 2 Bachelor's degree	1 Vocational Education (TAFE): 2 Bachelor's degree	It appears that the Occupational Therapists have a slightly higher level of tertiary training. This is expected as traditionally construction trades are taught at TAFE.
Are you from a Non English speaking background?	3 No; 0 Yes	3 No; 0 Yes	This is most likely an effect of the small purposive sampling and my not reflect the larger user group
What is your main occupation?	3 Occupational therapist	2 Metropolitan, 1 Regional	This is as expected, but implies that the HMMS users have a wider professional base than that of construction and this may impact responses.
What region of your state do you live in?	3 Metropolitan	2 Metropolitan 1 Regional	This is most likely an effect of the small purposive sampling and may not reflect the larger user group. The biggest limitation is that there are no remote users where internet connections may be more unreliable or slow.

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Table 2. Prior Internet familiarity

Internet familiarity	Occupational Therapists	HMM service providers	Interpretation
How confident are you with using computer? (Scale of 1-5; with 1= not confident and 5 = very confident)	4	4.5	This implies that those who volunteered to participate perceive themselves to have good internet skills. There appears to be a small difference between user groups, why this is so, is unclear. The overall high confidence levels may correlate to willingness to volunteer.
Access location	3 Home; 2 Work	2 Home; 3 work; 1 community resource centre/library	It appears that most participants had access to computers at work, but not all had access at home and one HMMS users stated that they were accessing computers away from work. On one hand, an Occupational Therapist employed by the health system had no ready access to the Internet at work, while on the other hand, a Home Modification and Maintenance service participant had access to a computer at work but shared this with other team members.
Frequency of use	1 More than once a day; 1 Daily; 1 More than once a week	1 Daily; 1 more than once a week; 1 weekly	The Occupational Therapists as a group appear to be slightly more frequent users but they also rated themselves as slightly less confident. However whether there is a correlation between usage and confidence is unclear.

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Table 3. Task of locating a case

Case location	Occupational Therapists	HMM Service Providers	Interpretation
Total time taken (mean score)	5-7 minutes	10 minutes	There appears to be a difference in the amount of time taken. Why this is so is unclear.
Case type	2 assessment cases; 1 modification case	3 modification cases	
Task accomplished	0 No; 3 Yes	0 No; 3 Yes	All users appeared to find the browsing task easily accomplished

Table 4. Task of submitting a new case

Case location	Occupational Therapists	HMM Service Providers	Interpretation
Total time taken (mean score, however not all users provided a value for this section of the survey)	15 minutes	25 minutes	There appears to be a difference in the amount of time taken. The amount of time taken may be attributable to the fact that the H-A-S components and the online presentation of components would be more familiar to Occupational Therapists than Home Modification and Maintenance administrators who will be more focused on spatial elements and who may be less familiar with human and activity data.
Case type	3 assessment cases	3 modification cases	This difference may relate to differing professional responsibilities.

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Case location	Occupational Therapists	HMM Service Providers	Interpretation
Task accomplished	1 No; 2 Yes	2 No; 1 Yes	Only half of the users actually added a case, this was because two users had trouble registering and one user stated they had insufficient time available to finish.
Comfort level (mean score)	OK	Ouch	This implies that users don't find this task very difficult and the difference between the two user groups may be attributable to order of presentation of information and amount of time taken.
Was getting client consent a barrier?	1 No; 2 yes	1 No; 2 yes	This appears to be an issue of concern.
Was having to scan in photos or plan drawings a barrier?	1 No; 2 Yes	1 No; 2 Yes	This appears to be an issue of concern and may be attributable to lack of access to scanners and digital cameras in the workplace.

Analysis of open ended qualitative comments

Additionally, the survey questionnaire also yielded some open-ended written statements concerning general impressions and the like. These were categorised into positive and negative responses across five sections as seen in Table 5.

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Table 5. Open ended feedback

Sections	Positive responses	Negative responses
Case studies model	✓ "all good" ✓ "the type of activities impaired [is good]" ✓ "good to be able to select a case by person impairment…also selecting a case by activity impairment is another feature that I would find really useful" ✓ "there is sufficient detail and background information provided about the case to obtain a good idea about the client, their problems and suggested modifications etc. I found that the cases are very through in this respect"	× "briefer and focusing on the main problems encountered" × "Medical diagnosis, is this necessary; also details of client name code, height and weight" × "is a need for brevity" × "need 'unknown/not stated' option for pension status question"
Reuse reasoning	✓ "re-used case versus the original source [is good]"	
Case presentation	✓ "always a good looking site" ✓ "quite user friendly" ✓ "before and after pictures [is good]" ✓ "listed in a category form"	× "some keywords were unclear, like "spaces" associated" × "tables with wider cells would be better" × "doesn't excite or create a curiosity"
User navigation browsing	✓ "easy" ✓ "good" ✓ "fine" ✓ "easy to navigate"	× "a list of all current case types instead of × searching with no result" × "I would look for 'innovative' ideas in handling problems or issues. I want to know what works"

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Sections	Positive responses	Negative responses
User navigation adding a case	✓ "helpful hints – pop ups with the exact item that was incorrect [was helpful]"	× "painful" × "trouble logging in" × "when saving person 1 it goes directly to person 2, should the × 'next' button be at the top of the page as well?" × "about the activity, it is not clear what to do, more instruction would be helpful"

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Interpreting feedback regarding Case studies framework

As can be seen from the table, participants provided both positive and negative feedback. It is interesting to note that one participant stated that the activity part was good given that this component was the area with the lowest number of web page views. The negative feedback can be broken into two types of comment. First, the issue of the number of components and second the values pertaining to some of the attributes were noted as being incomplete in some instances. Interestingly specific feedback relates to medical diagnosis, client id, height and weight. However, without this information it would be difficult to search for a case, check validity of interventions for clinical appropriateness to client anthropometrics or to mine cases for any potential clustering of interventions on the basis of medical diagnosis. For instance, at present it is commonly believed that the interventions for dementia and spinal injury are statistically similar despite different bathrooms and activity sets. Second, participants wanted additional drop down options including unknown as possible values for specific attributes such as income. It may also be that some of the HMMS providers do not have access to the level of detail about some of the fields required such as the person's height and weight.

Interpreting feedback regarding reuse reasoning

There was one positive comment and no negative feedback comments noted. Thus it appears this is a feature of the case studies area that participants appear to value.

Interpreting feedback regarding case presentation

While both positive and negative comments were noted, in balance participants appeared happy with the overall presentation. The negative feedback is primarily concerning small technical improvements with the exception of the comment regarding the lack of excitement engendered by a standardised presentation format. While this comment is important in terms of a standardised case presentation potentially not highlighting innovation sufficiently, this was not the intent of the case studies area. Instead, a more standardised presentation format may have the advantage of assisting or eliminating double data entry, because it is more rather than less likely, to fit the documentation format expected of home modification practitioners in the future.

Interpreting feedback regarding user navigation browsing

The majority of users appeared to be able to navigate the case studies area without difficulty. Nevertheless, one user commented on drop down menus having more options than those that are currently available. For instance a search for a maintenance case or for a rental property would currently produce no result. This is not an error of the navigation function per se but a limitation of case seeding initially undertaken when the case studies area was launched. In addition the indexing of innovation is potentially problematic because what is innovative to a database is any information not previously

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stored but this may not match the required innovation anticipated by a participant as what is innovative to them is any case component with which they are unfamiliar.

Interpreting feedback regarding adding a case

The case studies login issue was an unanticipated problem that appeared to be impacting participant's ability to add cases and which they experienced as frustrating. The users who mentioned this problem were contacted and further explanation sought. With additional verbal feedback, it became apparent, that this process generated two types of problems. For first time users, the computer generates a user name and password automatically (a six digit sequence of numbers and letters both the same). The previously registered user problem was directly, associated with the computational program, which failed to let users register a second time without remembering their original password. The new user registration problem differed and appeared to be associated with noticing that the user name and password were the same. This threw at least one user who had trouble because this violated their expectations of a typical login process and in this case their login failed because they attempted to enter their own name and then the automatically generated password.

Other qualitative feedback

The amount of time entering a case study while logged as under thirty minutes assumes that the case material is already documented and material is available in digital format. It appears that this time is additional to existing professional duties and this appears to be a critical issue with one user stating, "it would have to be done outside of regular work hours". The same user who commented about the need for case brevity also suggesting that they "would like to use a proforma in word and port it on to the site". This implies that double data entry is an issue. Client consent was another unexpected barrier with varying feedback, one respondent stated "that the case they wanted to enter had been on national television so this was not an issue" but another user stated "I had great difficulty in obtaining approval from my employer to approach my clients to see if they would participate..." None of the clients that I approached were willing to participate". Their reasons for not participating included the following; their houses were too messy to have photos etc. on the internet; don't want others seeing inside the house; or "don't have time to participate, too busy". The same user also reported that obtaining client consent and maintaining client privacy was a critical objective of their organisation. Overall, users appeared to value the case studies facility. The analysis of participant's open-ended written responses suggests that the layout, navigation and menus all appeared to perform adequately.

Suggestions for improvements

Some, users volunteered feedback more generally about how the HMinfo case studies web site might be improved. Feeedback in this category covered case indexing change, presentation, additional help features (i.e. more online instructions), and being automatically alerted when a new case was submitted. For example, one user

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suggested that indexing would be more helpful if innovative interventions could be "listed in a category form". Other users commented about technical aspect that could be improved such as "when saving person 1 it goes directly to person 2, should the 'next' button be at the top of the page as well?". Users also provided comment regarding the need for additional instruction and online help. Sample comments like the following are indicative; "about the activity, it is not clear what to do, more instruction would be helpful". As users appeared to value the case studies facility and feedback also included comments about what might motivate more regular usage. For instance, one user suggested that "knowing about new cases submitted, might make me return".

Summary

Feedback from participants indicated that the amount of time required to enter data and find cases was problematic as it was additional to their existing job demands. This was in a context where all participants mentioned heavy work schedules and case study usage is generally on top of normal duties. Case submission also meant a double up of data entry, as paper-based documentation is still the workplace norm. Additionally, a number of participants mentioned issues around the time associated with gathering case details from paper-based files and issues associated with converting drawings and photos to the digital format required for case submission online. Furthermore, gaining client consent is also a reason that cases may not be being submitted in the quantities originally anticipated, with several participants commenting that when they had approached their clients they were unable to get permission to submit case material.

In comparing the two sets of users, it also appears that there are significant differences in Internet experience, educational level and Internet access patterns. For instance, one of the participants employed by the health system had no ready access to the Internet at work. While all participants providing Home Modification and Maintenance services had access to a computer at work one participant shared this with other team members.

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