Aide's Aide: Assistance to Home Health Aides

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1 Prototyping Strategy

Even though HCI research community shows broad support for prototyping, there is no unambiguous preference or empirical research results that favor low fidelity prototyping over high fidelity or vice versa (Farnum, 2002; Lim et al., 2008; Liu and Khooshabeh, 2003; Kussmaul and Jack, 2006; Rudd et al., 1996; Virzi et al., 1996; Yasar, 2007). Lim et al. (2006) try to reconcile the two approaches by suggesting that using high and low-fidelity prototypes results in different types of usability problems being identified. The user needs and designer objectives should be the deciding factor in selecting prototyping techniques and tools. In other words, the prototype should facilitate the creation of a relevant environment where a user's experience with the system as well as the prototype itself can be effectively observed and evaluated by the designer (Hennipman et al., 2008).

In order to evaluate the overall concept of the *Aide's Aide* website i.e. to see whether the users are comfortable with the fundamentals of its design (e.g. layout, composition, naming scheme, etc.) the low-fidelity prototype is the best fit (Rudd et al., 1996). For the development of a low-fidelity prototype, I prefer paper and crayons. I decided to avoid automated sketching tools so as not to tie myself to graphical design choices at early stages and because a paper prototype is the fastest and most economical way to check if a designer is on the right track(Yasar, 2007).

However, the paper prototype does not fully suit my goals for usability testing. The paper prototype lacks autonomy, so it is harder for testing participants to turn into evaluators (Rudd et al., 1996). In other words, in prototype testing, the users are actors who must place themselves into the given circumstances¹, and with paper prototyping they have to share stage with another person who plays the role of a machine (despite the fact that users asked to communicate with paper it is not possible to discard involvement of another human and the relationship they share) so this human-to-human play has too many unknown variables that makes predictions of the validity of user evaluation of the system less

¹I use the term "given circumstances" as defined by K.S. Stanislavsky.

controlled. Electronic prototyping significantly reduces the number of unknown variables associated with participation of the designer and puts things in order in a sense that props are real (e.g., a computer is a computer), so it is easier for users to imagine themselves in the given circumstances of the evaluators.

Since my users are mostly novices and know me personally, I anticipate that with the paper prototyping they would not be immersed enough and mostly rely on me to show them how to "do things" (which is good since this would reveal potential usability problems). I should definitely get a lot of useful explorative results (Hennipman et al., 2008) from the rapid low-fidelity paper prototyping regarding layout, terminology, overall website presentation, and even user satisfaction, but my concern is that it will not be enough. In addition, I need an experimental prototype (Hennipman et al., 2008) that will put user one on one with a machine to eliminate the atmosphere of a make-believe play, so the users would be bound to pay more attention to tasks. Therefore, I made a choice of developing a second prototype, this time a digital and medium-fidelity (Farnum, 2002) or mixed-fidelity (Hennipman et al., 2008) prototype. This decision of choosing a mixed-fidelity over high-fidelity prototype is dictated mostly by the lack of time and the breadth and depth of skills necessary to develop a fully functional and graphically professionally looking product. The following list describes my strategy and the results for the second, mixed-fidelity, prototype based on the five dimensions suggested by McCurdy et al. (2006).

- Level of Visual Refinement: High. Probably realized more in breadth than in depth but I would still consider it as high-fidelity. Even though McCurdy et al. (2006) suggested implementation of lower level of "aesthetic refinement" for the early prototypes I felt that for the *Aide's Aide* system visual elements play a very important role (e.g. color coding), so a prototype with enhanced graphics would help me in observing user experience with the system.
- **Breadth of Functionality:** Realized as much as I physically could. High-fidelity prototyping for the breadth of functionality should help users better understand the system capabilities (McCurdy et al., 2006), enhance their experience (Hennipman et al., 2008) and therefore reveal a broader set of usability issues.
- **Depth of Functionality:** Not fully realized for all tasks but some major functions are fully implemented (e.g. adding or deleting news). I do not think that at this point of the system development the level of details for completion of the task is very important for observing user experience.
- **Richness of Interactivity:** Also realized as much as possible considering the severe time constraints. Level of interactivity of a prototype defines a level of "reality" for the users and, thus, should be realized as much as possible (Hennipman et al., 2008).
- **Richness of Data Model:** Not realized. Even though *Aide's Aide* website is a knowledge based system and users probably would expect to see some real data during testing, I made a calculated decision to spend more time for developing interactive and graphical dimensions of the website and let users suspend their disbelief on this dimension.

2 Prototype Description

As I mentioned above, I have built two prototypes. One is a low-fidelity paper prototype and another is a mixed-fidelity digital prototype.

2.1 Paper Prototype

This prototype faithfully depicts navigation system of the website and supports main tasks such as (1) login, (2) add news, (3) add carpool info, and (4) upload new document. It does not support completion of the "task sheets" task because the paper prototype would be a close resemblance of the actual task sheets so I thought it would be confusing for users if I gave them something they complete every week anyway. This prototype supports only the first layer of the system since it was designed more for the concept proofing than for task analysis. Here are the pictures of the paper prototype (they are also were enclosed in the Appendix of the Milestone 3 document).

	LOGIN·BOUTU
	ИМЯ ВПИМИТЕ СВОЕ ИМЯ
	ПАРОЛЬ ВЛИШИТЕ СВОЙ ПАРОЛЬ
	BOUTU
ECALI BI	Ы ЗДЕСЬ ВПЕРВЫЕ ОТВЕТЬТЕ НА ВОПРОС ВНИЗУ
KAK HAS	SUBANOTLA NEKLUU B AFENCTBE ?

Figure 1: First Paper Prototype: Login Page

It is hard to explain in words how this prototype works so there is a video that shows how it worked with users.



Figure 2: First Paper Prototype: News Page

Aide's Aide Russian Rom HOBOCTU DEALS/NEWS CARPOOL	e Health Aide Community of A SARONHEHUE TASK SHEETS	7 Philadulphia KAK 34710AHUT APPLICATION
Выберите нужный документ 4) • Документ 1 • Докушент 2 • Докушент 3	ИХ ПИСТЕ НА НЕГО «ТОБЫ З ИНСТРУКЦИЦ 1 Загрузите д Колинотер 2 Заполиите иносле упе казору 3 Отпесатан Г.С Print	АГРУЗИТЬ I • INSTRUCTIONS екулим на свей екулим на свей екулим на свей екулим на свей екулим на приметре. ти на приметре.
ДОБАВЦТЬ ИСВЫЙ 40КУ НЕНТ Назовите документ	1. Выбрать 2 2 Добавить	Документ Документ

Figure 3: First Paper Prototype: Task Sheet Page



Figure 4: First Paper Prototype: Carpool Page

Aide HOBOCTU DEALS/NEWS	¹⁵ Aide Russian Rome R TIOABO3RA CARPOOL	COETA AIde Commun SAPONHEHUE TASK SHEETS	ty of Philadelphie KAK 34TIOAHUTD APPELCATIONS
ОБРАЗЩ <i>Ы ЗАПОЛ</i> А • Как заролнить •	иення Докумення 1040 налогобую Реј	68 Ришу <i>дих</i> старижов	СБРАЗЕЦ 10 40
НАЗОВИТЕ ДОКУМЕНТ		Выбрать Асбавил	Докулент Остилент

Figure 5: First Paper Prototype: Applications Page

2.2 Digital Prototype

For the digital, mixed-fidelity prototype, I created a website in ASP.NET using C# and SQL server and Access databases. It supports all major tasks described in the Design document

(see Milestone 3) except for uploading images and SMS's. Due to time limitations and since vast majority of my users do not use SMS anyway and this feature was intended only for advanced users while users I am going to test prototype with, are not very proficient, so I decided to leave it out.

Also, for some of the tasks only the first layer of functionality is realized. Specifically, for the application and task sheet sections I did not develop a functional prototype for the second and the third layers. I think that users should have enough functionality on the first layer (it does everything they asked for), so at least for some time their needs must be satisfied.

Here are some of the screen shots of the digital prototype. I need to make some minor tuneups so I am not including everything.

	Aide's Aide
Добро пожаловать!	Вход Sign-in
Вы помогаете людям, а мы поможем Вам.	Имя Name:
	Пароль Password:
- B	Войти Enter
Посторонним В! Введите Ваше имя и парол Если Вы здесь впервые, зарегистрируйтесь	Ib справа. Вабыли пароль? Forgot your password? НИЖе.
Регистрация	
Имя	
Придумайте пароль:	
Введите пароль ещё раз:	
Ваше отчество (на случай, если Вы забудете пароль):	
Если Вы aide, то Вы знаете ответ на следующий вопрос:	
In ? (заполните пробел)	
Зарегистрироваться Register	

Figure 6: Digital Prototype: Login Page

3 Reflection

It was real fun and not a very time consuming process to draw a paper prototype and, even though it is a low-fidelity prototype that supports only basic functionality, it turned

F	Iово New	сти из Подвозка Carpool Task Sheet	Форм Applicat	ions Coветы Advice
Триве	r Elena!		Іобавить	Помощь Зарел. Вы можете: В этой части небсайт вы можете добавить свузице вность, например- то в где продвето на втой наске, расперизаль, процестива и т.д. и т.в. Как это сделать? Просто введсте свою новость в околно слева и важмите кнопку "добавить".
	Номер	Новость	Когда вовость	Вы можете удалить свою запись и начать все сначала.
<u>Delete</u>	1	В мексиканском овощном клубника по доллару	3/11/2009 12:00:00 AM	Нажмите кнопку "Удалить" рядом с Вашей записью.
Delete	29777	Новые новости каждый день	3/18/2009 11:03:05 PM	Вы можете исправить свою новость: перейдя на уровень 2.
Delete	40612	Сегодня в Кляйн бранче дают пайки ветеранам. Время с 12 до 3 часов. Надо иметь при себе карточку ветерана.	3/18/2009 11:46:26 PM	Как это сделать? Нажмите на звездочку с вомером 2.
Delete	24875	У Матюши болит нога.	3/18/2009 11:48:12 PM	Выбрать уровень сложности
Delete	5506	икра по одному долару	3/18/2009 11:53:13 PM	Лервый раз
Delete	63762	Сегодня в Беллсе распродажа молодой индюшки по 1.59 за поунд. Но надо взять целый поунд.	3/19/2009 12:29:01 AM	в первый класс
<u>Delete</u>	78287	А у нас сегодня газ. А у Вас?	3/22/2009 6:36:41 PM	Второклассник и второгодник
				3 Мастер-ломастер

Figure 7: Digital Prototype: News Page

ľ	Iово Ne	ости ws		Подво Сагро	зка ol	Работ Task She	a Popr ets Applica	dы tions Advice
								Помощь
1	Има	Kow	LT 9 LT	Лань	W PRAME	Kyna erev		Здесь Вы можете: В этой части вебсайта вы можете
Delate F	lana	215 - 3	78-4567	3/20/2009	1-50-00 AM	aganetuo	hals dom	добавить подвозку. Если вы куда-то
Delete E	lena	215 65	5 7890	3/21/2009	0.00-00 AM	agentativo	Ugol Basleton i Veree	саете и можете подвезти, оставьте сообщение. Вы также можете обра-
Delete E	lena	215 65	5 7890	3/21/2009	0:00:00 AM	agentatvo	Ugol Basleton i Veree	титься за помощью, попросив подвез-
Delete E	lena	pishita pis/ma		3/23/2009	-00-00 PM	nilaula	prosto katavas'	Как это сделать?
Delete Y	elena	215 789	9 0456	3/27/2009	5:30:00 PM	1 77777777	וווווווווו ווווו	Введите свою информацию в поля внизу страницы и нажмите кнопку
<u>Delete</u> E	lena	555-12	12	4/1/2009 1.	:00:00 PM	agentstvo	belyg dom	рите взадратия "Поврему", если вам нужна подкола - "Проди подекти", Котите удаать свою запись? Назмите коноку "Укратить" рядом с Вщией записаю: Хотите исправить свою запись? Вы может сигранть свою запись? Вы может сигранть свою запись. перейов на уровень 2. Как вто сделать? Нажмите на лиедочку с номером 2.
Выберит	е роль:		Выбери	ге дату:	Впишите	Время: напри	мер 12:30	Выбрать уровень сложности
 Подвезу Подъеду 3/1 		3/12/20	2009 14:00		Первый раз в первый класс			
Откуда в	ы едет	e:	belyj de	j dom			Proportacentry	
Куда вы едете: agens		agenst	enstvo na street road			2 и второгодник		
Как с вами связаться: (2 Нажмите кнопку:		(215) 7	215) 765-8090					
		B	Ввести Информацию Elena6			мастер-ломастер		
@ 2	009 Ai	de's Aic	le					

Figure 8: Digital Prototype: Carpool Page

out to be a very useful and effective tool for discovering several usability problems and

Paper Prototype Video

Digital Prototype Video

·····						
	Aide's Aide					
Новости News	Подвозка Carpool Pабота Task Sheets Applications	Советы Advice				
Помощь						
Государственные прог	раммы					
Номер	Новость	День				
1 Обама подписал ук	Обама подписал указ об увеличении фуд стемпов для неимущих.					
4521 Новая жилищная пр заполнить всячески	рограмма для пожилых открывается в нашем городе. Надо поехать на край света и te документы.	3/21/2009 4:27:11 AM				
Медицинские советы		1				
Юридические советы						
Разное						
O Totyapenennae nporp	Назовите свою новость	Elena				
		Добавить				

Figure 9: Digital Prototype: Advice Page

getting an overall conceptual feedback on the system. For example, I found that my naming scheme is confusing for users. Unexpectedly, I found that the users are very enthusiastic toward "unreal" paper prototype and understand its concept perfectly and with ease, so the suspension of disbelief is not really an issue in this case.

Naturally, I found that digital higher-fidelity prototype is much more time consuming and is much harder to implement. But that is what I was expecting from the beginning. I did not expect my design ideas to be so bound to a particular technology (.NET in my case) and my experience in it. That made prototyping process much less flexible and creative.

In the future I would prolong testing with paper prototypes starting with low-fidelity prototypes and refining my design ideas gradually bringing paper prototypes to higher fidelity level. After that I would build a digital high-fidelity prototype.

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