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*The Kitchen Sync Team Presents:
“Roamin’ Calendar”*

A mobile instant-synchronization scheduling
tool, designed for active families

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Overview

The Kitchen Sync Team, through careful observation, research, and modeling, recommends the Roamin' Calendar as a product worth pursuing. This product is an HCI for the modern, technically aware, family.

Design Sources, Shaping the HCI

Inspiration For The HCI

The cartoon shown below was actually one of the influences early on that inspired us to choose this HCI from among several candidates. We felt that if the cartoon spoke to a situation common enough and familiar enough to be perceived as funny by a mainstream audience, then it spoke to a need that our HCI could address.

Subsequent research into various sources, including those listed in Appendix A, corroborated this initial inspiration and our decision to proceed with this HCI. Several of these sources, and several products already existing in the marketplace, indicated a need and a feasible market space for this HCI, but each of them failed to specifically address the needs we had identified:

- FusionOne (<http://www.fusionone.com>) offers a product that synchronizes multiple kinds of data across multiple devices. This indicated the feasibility of our intention to eventually handle both a new appliance and an “overlay” to existing PDA technology. However, this product is geared toward the individual rather than groups, and it requires login to a server, both features we considered unacceptable for Roamin' Calendar.
- Microsoft Exchange/Outlook (<http://www.microsoft.com>) offers powerful simultaneous synchronization of group schedules, and can even identify other group members' busy times and suggest alternatives — all functionality we foresaw for Roamin' Calendar. However, this application depends not only on server login, but requires a dedicated server specifically configured to exacting Microsoft standards; these attributes were clearly not implementable for families and unacceptable for Roamin' Calendar. Moreover, Outlook must be synchronized to a PDA from a desktop computer in order to provide mobile schedule information, and cannot be updated “on the fly” while mobile.
- Lotus Notes (<http://www.lotus.com>) suffers from most of the same limitations as Microsoft Outlook, but did offer one element of inspiration: a robust Web-based client that did offer simultaneous synchronization, theoretically from any device with Web access, including a PDA. However, it once again requires server login, which we found unacceptable.

Figure 1 Vinnie & Mrs. Gilcrest



As a mother of three active teenagers, Marilyn Gilcrest relied on a professional dispatcher to help coordinate her day.

- TrueSync (<http://www.startish.com>) provided one of the strongest inspirations, in that it offers simultaneous synchronization of multiple kinds of data across multiple PIMs from both its desktop and Web-based versions. This was close to what we wanted — close enough to serve as inspiration — but it still required that the user(s) log into a server and initiate the synchronization; it could not detect schedule changes and automatically begin synchronization and reconciliation.

Although each of these existing products indicated clearly that there was a viable market space for synchronization and schedule reconciliation, we felt that none of them truly fulfilled the purpose and promise we foresaw for Roamin' Calendar, with its ability to automatically detect schedule changes and synchronize / reconcile them without the need for server login.

Presentation of Design Idea

What is a family calendar?

For our purposes, a family unit consists of a couple, or at least one parent and one or more children. What distinguishes a family calendar is that it is a consolidation of all family activity where one can see at a glance what activities are occupying family time.

One person maintained most family schedules in our study. For purposes of illustration, we will call that person Mom. This person is the manager of the family calendar and is responsible for keeping track of the other members of the family and how to get them to and from their activities. They generally include important personal events, and may also track their partner's events when they are different from the norm (for instance out of town for a week). Mom tends not to record things that are done routinely, such as basketball practice that occurs every day after school where she is always the designated driver. However, she may record occasions when someone else takes over.

The method used for tracking the family activities needs to be central and available to all family members. That's why the calendar on the wall works, but it can't be in the car with Mom and also available in the kitchen at the same time. When the children are young, Mom might keep track of these activities in a day planner that she carries around with her, but then Dad won't know where she is when he gets home early hoping to take the family to the circus.

What does RC do for families?

We envision a device that runs a calendaring system with special provisions or functions to keep the family synchronized and in touch. When Mom adds an event or approves an event, she enters that on her RC. The event is immediately updated on wireless devices that are carried by other family members.

Parents carry the full function RC device. Older children probably use the same device. Young children may use a version that simply notifies or reminds.

The RC will be an automated referee, handling requests, notifying of conflicts, reminding of unresolved conflicts and approvals needed. Mom will be the administrator and overriding authority.

Beyond basic calendaring activities such as recording start, end, and location, the RC would include these features:

Family Related

- Record who is involved
- Record method of transportation and who provides it
- Allow for Approvals and Overrides by Mom
- Portability via other web enabled devices using wireless fidelity technology
- Requires confirmation when notice is a hand off of responsibility such as partner now needs to accept the chore
- Filters such as scheduled activities for a specific family member

Conflict Resolution Support

- A conflict notification and resolution process requiring confirmation
- Demands attention for imminent unresolved conflicts

Notification

- Instant notification and synchronization
- Reminders of upcoming events, unresolved conflicts, and approvals needed
- Alerts of changes and updates in a message format on the RC device

Observation Plan

participants + actions + activity = target observation

Families making up the target audience need to maintain busy schedules that frequently change, have recurring activities, priority activities, and inter-related activities. We captured how they dealt with changes to their schedule.

Observation Excerpts

Darlene and Ashley

Ashley called to ask if she could go to a friend's house after school. There was no activity on her calendar column, but both she and Mom knew that she was expected home to perform household chores that were overdue. After several exchanges where Ashley pled her case and Mom gave her reasons for saying no, a compromise was reached. Mom told her she could go to the friend's house, but had to be home by 4 p.m.

Lesley and Mike

Lesley needed to look for book titles at the local Borders bookstore, purchase items for Gracie at the local mall, and considered taking Gracie to the portrait studio at the same time. Agreeing on a rough schedule with Mike, Lesley set off for downtown Santa Cruz, the location of the Borders bookstore. Gracie managed to dump every Nancy Drew book (located next to the book titles Lesley wanted) on the floor, which slowed Lesley down while she put them back on the shelf — she was already running late.

Lesley arrived at the Capitola Mall, it is in an area notorious for its extremely thick and unpredictable traffic. Although she found the items for Gracie and chose not to use the portrait studio, the 41st Avenue traffic once again slowed her down. She had to call Mike to let him know she was running late, and this meant leaving a message on the home phone; this, in turn, meant that Mike was probably in the pasture and would not get the message for some time, so he could not confirm Lesley's change of schedule for some time.

Ginger and Brian

On Friday, January 31, 2003, Ginger and Brian were observed while they coordinated efforts for her candle party at their home in Elizabethtown, New York. Brian was still at work when the observation began. Last minute difficulties with the children convinced Ginger to take them over to her parents home for the next ½ hour so she could prepare her home for the party. She had to make sure her parents were available by calling them on the phone. She asked her mother whether she could take the kids there for a little while. Ginger's mother agreed. Then she had to prepare the children to take them over to her parents' home. At that time, they discussed when Brian was coming home to take the children to his mother's home. Ginger and her mother established a time to pick the children up at their house before Brian was to take them.

In meantime, she tried to contact her brother using the telephone to aid her with party preparation without any luck. Instead, she phoned her mother about the need and her father to brought over an extra table. After some time, the children were picked up from the parent's home. While there, Ginger verbally coordinated times with her mother to bring over food items for the party and she confirmed when her mother was going to join the party. Back at Ginger's home, unannounced, her mother-in-law stopped in to see her. This event caused Ginger to slow down her preparation. Finally, Brian came home and Ginger assertively packed the children's things. Ginger told Brian what to feed the kids and when to bring them home after the party was over. Brian listened to her and did not offer an argument. There was some nodding of agreement to her commands. After he listened to her instructions, he left with the children.

Mary Lou and Ken

The observation recorded concerned a wedding planning activity that both Mary Lou and Ken agreed to work on together. Mary Lou contacted a photographer by telephone earlier in the month to inquire about availability. The photographer and

Mary Lou had continued communication via email. Mary Lou previously sent the photographer date and time options for a potential one-on-one meeting. Mary Lou and Ken discussed possible dates using his work schedule, her school schedule, and a wall calendar. Once the dates were set, Mary Lou emailed the options to the photographer. This observation regards when the photographer emails back an agreed date, time, and place.

Mary Lou went to work and checked her email. Within her email was the photographer's response. She assumed this was an acceptable time for herself and Ken. Mary Lou responded back with an acceptance of the appointment. Then she forwarded the email to Ken. After emailing Ken, Mary Lou wrote down the appointment onto her desk calendar. Then she continued to check other new emails.

Observation Summary

In general, our observations show that a significant amount of time is spent in communication such as notification, waiting for confirmation, and creating the activity if more than one person is involved. Actual recording of the new or changed information takes little time whether using electronic or paper medium.

The person with main responsibility for scheduling, in our observations, has some familiarity with desktop computers and cell phones. These people would be good candidates for our HCI, and some have expressed interest in such a tool. Although several observations involved divergent couples wherein one member was familiar and comfortable with technology, the other might be unfamiliar or not convinced of the technology's reliability. Nevertheless, we feel the combined functionality of Roamin' Calendar — ease of notification and ease of schedule reconciliation — makes it a good fit with these couples regardless of the scheduling "role" assumed by any of the participants. Each can use Roamin' Calendar to be as active or as passive as desired in creating and reconciling schedules.

These observations from vastly different family scenarios and backgrounds, together with our source material research, confirm our original HCI transformation opportunity. We believe our observations have given us a good basic understanding of the mechanics required to add and change schedules.

We are confident that simultaneous synchronization of a group's schedules, which is required for the RC to be successful, in a way that consolidates, coordinates, rearranges, and notifies, can be accomplished with existing and developing technologies.

Transformations

RC addresses the scenario of last-minute changes and the risk of missed appointments, by coordinating all of it and serving as "dispatcher". Mom's on the road? No problem, she can still base scheduling decisions on accurate, up-to-date information. Ashley forgot her chores? No problem, RC would remind her, also indicating that she could still fit in a 1½ hour visit with her friend.

Lesley and Mike's transformation would take place mostly at either end of the activity duration. That is, RC would greatly speed up and simplify what Lesley calls the "negotiation" phase. Mike needs the truck until 2:00, but Lesley wants to leave early? No problem, they can see that at a glance — even if Mike is in the back pasture. Mike needs Lesley home by 4:00 so he can use the truck again? No problem, they can both see the need. Lesley's at work and will be late for their 7:00 appointment? No problem, she can let Mike know, suggest a new time, and have it all done in time for Mike to confirm with the babysitter.

Brian needs to stay late at work, but knows he's expected to help with childcare? No problem, he updates his RC and Ginger gets notified of the conflict. She is alerted of the need for alternate childcare. While the RC can't solve all her scheduling problems, it helps by removing some of the stress. Brian knows when the party is over and he can return home with the children. If necessary, Ginger could have changed the RC schedule in such a way that Brian knew to pick up the children from Ginger's parents house.

Mary Lou could have added the photographers interview to her RC, seen that it didn't conflict with Ken's schedule, and update Ken's RC automatically. She wouldn't have to write it on her desk calendar, and then remember to write it on the calendar at home as well.

Issues

Developmental

There are development issues that still need to be addressed:

- Create a new device or piggyback on existing devices?
- Select an existing calendaring application and add features or build our own?
- Wireless network's unpredictable reception and airtime costs
- Find devices suitable for every member of the family who needs one
- Time — the team does not have time to bring this to market
- Team skills include basic understanding of databases and use of electronic calendars, but limited knowledge of implementing and integrating wireless technology

We have found multiple sources specific to our HCI that give us perspective and will help keep us up-to-date on standards and application issues. These include:

-  The Wi-Fi® Alliance www.wi-fi.org was formed to certify products to the IEEE 802.11 specification and has been doing so since March 2000.
- The Wireless Developers Network www.wirelessdevnet.com has the latest research, news, and articles in wireless technical breakthroughs, Java development, IEEE 802.11 devices, PDAs, short message service (SMS), and offers a glossary of terms related to the industry. <http://www.wirelessdevnet.com/glossary/default.html>

Current Culture of our Sample Families

- The family currently depends on the wall calendar in a centralized place or on Mom to notify and remind them of activities.
- Mom tends to keep a lot of information in her head.
- Younger children don't carry wireless devices.

Issues of Transformed Practice

- Mom may need to record more recurring information instead of keeping it in her head so that other family members are aware of her obligations. They probably already know, but as they come to rely on RC, they may forget these items.
- Mom needs to update information, such as cancellations and changed ending times of recurring activities to make RC effective.
- We would need to ascertain devices that are attractive and convenient for younger children that would allow them to be aware of activity schedules, changes, and also allow reminders and conflict notices.
- Families may regard the investment cost and ongoing service fees too expensive.

Cultural Limitations to Development

- The expectation that families would add another device to track activities may not be acceptable. We may need to think about adding this feature to existing devices.
- The small screen, or lack of real estate for display may be a problem.
- If we want to take advantage of cell phone users with a piggyback product, the display is a problem. People are getting used to email on cell phones. But there has been a trend to smaller cell phones, meaning less screen space.
- The interface would need to be two-way if we expect other family members to add activities on their portable device. This means an input device of some sort is required
- The wireless coverage is spotty. Currently, the wireless network has pockets where there is no coverage so a method of asynchronous update and verification must be present.
- Our product depends on existing and emerging wireless technology and devices. Similar products exist, but none are marketed to the family using

this technology. The concept of group calendaring is successful, and many features can be built upon for our product.

- The success of our product will depend on the public's willingness to carry and use the RC devices. Our selection of which devices to use is important.
- Cost of wireless technology may hinder acceptance.

Potential Impact

Market Trends

We have identified sources that show the RC is well positioned in the market place. Specifically:

- PalmSource, makers of the Palm PDA, has recently introduced an operating system designed to work over multiple platforms such as smart phones and pocket PCs. [Marketing Sources, 2]
- "The wireless LAN market, expected by Cahners In-Stat to reach \$2.8 billion by 2005, is ripe for innovation, and analysts say a dozen startups could launch this quarter alone." [Marketing Sources, 3]
- In 2002, according to Richard Shim and Ben Charny, ZDNet News [Marketing Sources, 6 & 7], sales prices per wireless device are down over 30%, and the wireless trend is accelerating.

Cultural Opportunities

- Automatic electronic conflict resolution: Mom can request that another family member assume responsibility, notify that member and schedule if she sees no conflicts, and there can be suggested resolutions. It is important to her peace of mind that there be a required affirmative response.
- Reminders using optional modes: messaging like on the cell phone, spoken, vibrate mode with messaging on demand, reminders until turned off
- Children's version: maybe a watch or other jewelry with messaging or some type of reminder, and GPS for tracking could be incorporated
- Home Central: a large version, maybe a flat monitor that can be hung on the wall of the kitchen, with controls to view the default (current month/week/day) as well as other filters to show one of more members side-by-side, history or search such as for doctor's visits

- Home Central printouts: Darlene feels that a paper backup will still be required. She has a real fear of losing all the information, and historical information such as Annie's first steps, is as valuable as future events.
- Vehicle Readout: a display that can be affixed in the vehicle that is larger than the PDA and can be viewed by the driver. It should have some intelligent filtering like knowing the time of day and show only the next 4-12 hours. Maybe this could be combined with the GPS request to show where the children are.

Other things observed that can be opportunities with this transformation, but not mentioned as problems by users:

- Transferring of recurring items from month to month
- Updating recurring items, for instance the ending time for Abby's gym sessions for the next two months.
- Transferring and updating from BlackBerry, Palm, and other pocket PC devices
- Mom's approval of child-added events – changing from tentative to approved

Bill Gates touted "Dick Tracy type" watches, with the ability to display personal calendars and messages, using SPOT (smart personal object technology), at CES early this year. [Marketing Sources, 4]

Many families are using calendars of some sort. Although many families have embraced cell phone technology, they have not embraced PDAs — at least, not as a family, although individual family members may be PDA owners. We believe that the right product, blending these two ideas have a potential market for the family calendar using wireless fidelity technology.

- In "The unwired family" [Design Sources, 6], Jørgen Sundgot discusses how to improve family life with a Personal Information Management device that comes surprisingly close to what we are suggesting for the RC.
- On a website called Mom's PDA, we found that Kristine Roberson is dedicated to providing resources that Mom [or other family manager] can use on their handhelds to help manage their time, careers and family. [Design Sources, 7].

It further validates the idea that moms need PDAs for tracking busy schedules. It claims to be a single resource for mom and her PDA. The website offers articles and software reviews for PDAs and related application software to make mom's job of organizing and scheduling easier. Freeware may be found on the site or mom could use the site to shop for gadgets, PDAs, software, GPS, navigation equipment or general interest items in the children/parenting area.

Strengths of the website include encouraging the use of PDAs. Through various up-to-date articles, the website details how these electronic devices will better parenting skills. It will accomplish this activity by allowing for easy accessibility to a small easy to carry device, a device that may be used to organize, file, store, and schedule family activities.

A weakness of this momspda.com is that it addresses only mom. The Website fails to realize the changing parental roles of families today where fathers, grandparents, and others besides mother take that role in households with children.

Another weakness to the site it that is offers products, software, and equipment that require manual updates. These are stand-alone systems that do not use wireless connections to synchronize activities with any other family member.

Conclusion

These observations from vastly different family scenarios and backgrounds, together with our source material research, confirm our original HCI transformation opportunity. Simultaneous synchronization of a group's schedules in a way that consolidates, coordinates, rearranges, and notifies, can be accomplished with existing and developing technologies.

The person with main responsibility for scheduling, in our observations, has some familiarity with desktop computers and cell phones. These people would be good candidates for our HCI, and some have expressed interest in such a tool.

In general, our observations show that a significant amount of time is spent in communication such as notification, waiting for confirmation, and creating the activity if more than one person is involved. Actual recording of the new or changed information takes little time whether using electronic or paper medium. We believe this is a viable HCI product because families need better, synchronized knowledge of activities.

According to a CEA funded study, 61% of men and women believe that technology has made life *easier* for them, but only 47% feel it has helped them juggle their career and personal life [Marketing Sources, 1]. We believe they want help, and Roamin' Calendar is here to offer it.

Appendices

1) Definitions

Actions include (with some minor variation from family to family):

Create a scheduled activity

Source of the information regarding the event can be a phone call from another parent, teacher, partner, child, or friend. It can be a message left via email, answering machine, or snail mail. It can be planning a party, buying invitations, making preliminary phone calls. It can be going through the children's school work and backpacks to search out school sponsored and related functions.

Regardless of the source of the event information, we have defined “create a scheduled event” to mean setting aside time for that event, and logging it into a scheduling system of some kind, no matter how formal or informal.

Assign an “owner” and/or responsibility to that event

This is defined as determining which family members are involved in the event and who is responsible. This can involve one or multiple family members. If someone outside the group is responsible, then only the participant is assigned and responsible party is noted.

Change event time

Addition, modification, or removal of an event time

Change event location

Addition, modification, or removal of an event location

Change event “owner” or responsibility

Addition, modification, or removal of a responsible party

Notify

Send email, call, send invitation, call teachers, update others involved, when one or more scheduled events conflict with, or overlap, already scheduled events. This may also occur because of time changes for previously scheduled events.

Confirm

Actively seek and receive affirmation or assume the change is effective. This depends on how many participants are involved and whether the event owner is making the change. The change can include the decision not to take action at this time, or to put aside for later consideration.

Reject

The opposite of confirmation, requiring the event owner or partner to follow up with a new change, notify, and confirm cycle.

“Event owner” = This is generally the originator of the scheduled event, but is thereafter the person in charge of maintaining the event’s schedule, location information, and notification of participants.

“Responsible party” = This is the person who transports to and from. It can be the participant and doesn't need to be by car. For instance if a child goes to a friend's

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house and the house is in walking distance, the child is responsible.

“Participant” = Any person taking part in the scheduled event.

2) Observations Analysis

The Ingrams

Overview of the Family

The family consists of Mom (Darlene) and Dad (Joel) in their early forties, Ashley is 16 and doesn't yet drive, Alexandra is 9, Abby is 7, and Annie is 2. There is another daughter April who lives a mile or so away, works odd shifts in 2 jobs, but can often be called on to resolve transportation conflicts.

Darlene is clearly the owner of the family scheduling. She has a familiarity with desktop computers and expertise with cell telephones. Darlene works periodically in the residential title/escrow field that requires she do research, use the telephone, and keep paper files. A lot of her work, such a printing contracts, has been automated and she uses a desktop computer to do her job.

Joel is a techno-geek as a manager of e-Commerce who held previous jobs as director of IT. He still loves gadgets and makes good use of them. He currently uses a BlackBerry device for connection to the office calendar and email. He is a good example of not being able to leave the office behind, and he seems to be ruled by his electronic calendar. Joel has tried to get Darlene to use electronic calendaring, but she has so far resisted, finding it more trouble than it is worth with no value to it. She doesn't trust it to not lose her information if it crashes, and it's too small to show the information she needs.

Analysis of Normal Activities

In order to oversee the family calendar, Darlene needs to know her partner's schedule as well. This is so that if she needs help and Joel is free, she may ask him to accept responsibility. Otherwise, she will look at alternative drivers or rescheduling possibilities.

There are primary activities that take precedent over others. For Darlene they are Abby's gymnastics and Alexandra's dance on Wednesday and Friday. Each of these activities are out of town, and require that all children attend unless they go to a friend's house, and dinner is always at fast food on the way home.

Common things that only Darlene is responsible for such as grocery shopping and laundry don't show up as scheduled activities and are done as needed when they fit in. My observation is that they are

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always behind in laundry and house cleaning, and make frequent trips to the grocery for last minute items. I didn't ask how she plans her meals.

Every night before going to bed she reviews the next day's calendar. She needs to know if she has to get up early to get a shower or make lunches depending on her own schedule for the day.

Children can add events to the calendar, but they know that if Mom hasn't said yes, just because it's on the calendar it doesn't mean it's been approved. Mom has a coding system for the older child with tiny checkmarks for what she has approved (and the child doesn't know of this coding). Each child can do two things per week, so she needs to see the whole week at a glance for each child.

She generally puts new events on the calendar immediately. When she turns over the new month, the recurring items are transferred then.

To make a change or delete an item on the calendar, she simply puts a line through the invalid info. She and I had set up our meeting for Tuesday of this week, but had to change it because one child was going to a friend's house for the night and Thursday seemed like a better opportunity to observe how she uses her calendar. In addition, she had hoped to use my husband's truck to move some furniture to her older daughter's apartment, but it snowed that day. So an entry shows up with a line through it on Tuesday as well as the new one on Thursday.

Purpose and Special Requirements

She uses the calendar to know where she needs to be and when. She uses it to track where her children are. A built in GPS system for the children would be an ideal enhancement.

She needs to be able to see each child's calendar and her own calendar, sometimes side by side, for a week at a time at a minimum.

Mediation Tools

Darlene's tools are the calendars and a marking pen, although there isn't one attached to the calendar in any way. I notice that she doesn't use color-coding. She receives notices and requests via school notices, telephone calls from and conversations with her children, other parents, teachers, doctors, and other children. She reviews messages on the answering machine.

There is a main calendar which Darlene has used for the last three years which is approximately 18" x 36" when unfolded and hung on the wall. It has 5 columns, one of which is already labeled Mom. She writes the names of the four children who still live at home at the top of the other columns.

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Mom's column is filled with her personal calendar items such as doctor's appointments and days she works. In addition, any activity that requires her to be present is listed there such as driving the older girl to a birthday party, driving to gymnastics, attending a daughter's basketball game or band recital.

Each child's column has activities listed that Mom doesn't have to attend such as staying overnight at a friend's house, or an activity where another parent or sometimes the child is responsible for transportation.

In addition to the main calendar, there is a school lunch calendar. For elementary school, there is the menu for the day, and Mom makes a diagonal line across each day. On the right side is Abby and the left side is Alexandra. Each girl can buy lunch 10 times each month and they pick the days by writing B(uy) or T(ake) when the calendar is brought home and put on the refrigerator. This way, Mom knows how many lunches to make and who needs money.

There is another calendar sent home by the school with spelling words and test dates for Alexandra.

Observations

Ashley called to ask if she could go to a friend's house after school. There was no activity on her calendar column, but both she and Mom knew that she was expected home to perform household chores that were overdue. Mom told her she could go to the friend's house, but had to be home by 4 p.m.

When Alexandra came home from school, Mom went through Alexandra's backpack systematically and found a parent notice regarding a Free Child Safety Program for fingerprinting and photographing available next Wednesday or Thursday. Mom looks at the calendar for Thursday, because she knows that Wednesday is already taken up with gymnastics and determines that she can take the children on Thursday. She marks this on the calendar and puts the notice on the kitchen counter pile of other similar notices.

Abby brought home a schedule change for gymnastics. Instead of the normal 3 hour sessions, they will be doing make up sessions for the older girls and so Abby's group will be cutting their sessions to 1 ½ hours on the same days for the next two months. Mom doesn't bother to write this on the calendar. But Mom confesses that when this happened before, she forgot to pick Abby up early and showed up at the normal time. She was lucky that the gym was still in session and Abby was well taken care of during that time. She believes that if the gym closed early, Abby would have gotten another mother or the coach to call her on her cell phone to let her know.

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Ginger and Brian Phinney

Overview of the Family

The Phinney family of 4 resides in rural upstate New York. Ginger and Brian, a husband and wife team, are constantly on the go with Logan in Kindergarten, age 5, and Wade who is still at Daycare at the age of 15 months.

Both husband and wife work full time. Ginger works as an Employment Specialist Assistant with convenient access to her own desk computer. Brian works in a garage where computers are not readily available. He often does side jobs that require him to work late. In addition, he is a volunteer fireman with weekly meetings and unscheduled events (emergencies) as required by this duty.

Mediation Tools

To manage family schedules they rely on low-tech mediums to record appointments, events, and activities. These mediums include telephones, pens, verbal, memory recall, and wall calendars. She is notified of events via phone dialog, answering machine, school notices, party invitations (mail), email, and verbally during one-on-one conversations. She coordinates many of these activities while at work where she is responsible for receiving all company phone calls and has immediate access to a computer, pens, and paper. A heavy percentage of her scheduling changes and updates are relayed orally then dialog occurs to confirm, reject, or deliberate about these situations between her and Brian.

Analysis of Normal Activities

Ginger mainly coordinates the family events. Ginger schedules both sons' appointments for school, doctors, and general activities. She is in charge of getting the kids to their appointments. With her own personal activities, she coordinates with Brian, her parents, and/or childcare providers to be responsible for the kids in her absence. Last minute changes do occur but connecting with others is difficult. Often she must plan weeks ahead if possible to schedule her own personal events to establish reliable childcare. Conflicts do arise even when events are planned ahead. Cancellations occur due to the lack of communication between Brian and Ginger in fear of lack of childcare coverage. Usually, the children's activities come first in their lives and the parents must try to find time for their own purposes. When Brian is unavailable, Ginger relies on her parents who live next door to take over some of the day care, or transportation of children responsibilities.

Observation

On Friday, January 31, 2003, I observed Ginger and Brian coordinate efforts for her candle party at their home in Elizabethtown, New

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York. When I got to their home, Brian was still at work. Last minute difficulties with the children convinced Ginger to bring them over to her parents home for the next ½ hour so she could prepare her home for the party. She had to make sure her parents were available by calling them on the phone. She asked her mother whether she could bring the kids over for a little while. Ginger's mother agreed. Then she had to prepare the children to take them over to her parents' home. At that time, they discussed when Brian was coming home to take the children to his mother's home. Ginger and her mother established a time to pick the children up at their house before Brian was to take them.

In meantime, she tried to contact her brother using the telephone to aid her with party preparation without any luck. Instead, she phoned her mother about the need and her father to brought over an extra table. After some time, we went over to the parent's home to pick up the kids. She verbally coordinated times with her mother to bring over food items for the party and confirm when her mother was going to join the party. Back at Ginger's home, unannounced her mother-in-law stopped in to see her. This event caused Ginger to slow down her preparation. Finally, Brian came home and Ginger assertively packed the children's things. Ginger told Brian what to fed the kids and when to bring them home after the party was over. Brian listened to her and did not offer an argument. There was some nodding of agreement to her commands. After he listened to her instructions, he left with the children.

Mary Lou and Ken

Overview of the family

A family on the rise, Ken and Mary Lou are currently engaged and live together. At this time there are no children involved with the new family. At this time, their only children that could be considered are 2 dogs and 2 cats. However, they work as a team to coordinate wedding planning, work, and personal activities.

Both Ken and Mary Lou work full time with part time jobs. Ken works out of the home as a New York State Department of Environmental Conservation Officer with policing duties. He works ever-changing shifts including weekends, nights, early mornings, and overtime. On the side, Ken works as part time faculty at a local Community College. He is a member of a local hockey league in the evenings.

Mary Lou is a full time Employment Specialist (a.k.a. Computer Lab Instructor) at a local not-for-profit agency. She is a part time student via distance learning through RPI. Occasionally, she instructs part time at a local community college.

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Mediation Tools

The couple is very busy. Both use electronic mediums including desktop computers, and laptops with Internet access to email. Both have at least 2 email accounts with different email providers. Currently, the couple use individual calendars in both paper and electronic forms to record events. The telephone with answering machine is a large aspect of communicating changes and/or general scheduling.

Analysis of Normal Activities

Conflicts arise often and the demand for strong communication is necessary. Wedding planning activities are constantly requiring more attention since the date occurring in a few months. Mary Lou and Ken contact each other often throughout the day by telephone and leave a message on the voice machine/voice mail if the other is not available. Email is used when the information about an appointment is already in text format and not urgent. Usually they spent their evenings with each other and plan for events verbally and record them on a wall calendar.

Observation

The observation recorded concerned a wedding planning activity that both Mary Lou and Ken agreed to work on together. Mary Lou contacted a photographer by telephone earlier in the month to inquire about availability. The photographer and Mary Lou had continued communication via email. Mary Lou previously sent the photographer date and time options for a potential one-on-one meeting. These dates were discussed by Mary Lou and Ken using his work schedule, her school schedule, and a wall calendar. Once the dates were set, Mary Lou emailed the options to the photographer. This observation regards when the photographer emails back an agreed date, time, an place.

Mary Lou went to work and checked her email. Within her email was the photographer's response. Assuming this was an acceptable time, Mary Lou responded back with an acceptance of the appointment. Then she forwarded the email to Ken. After emailing Ken, Mary Lou wrote down the appointment onto her desk calendar. Then continued to check other new emails. At that point the observation for this event ends.

Appendices

Lesley and Mike

Overview

Lesley and Mike are a husband/wife couple with a 2-year-old daughter Gracie. Although Gracie is clearly too young to have a schedule of her own (although she does frequently consult with her large teddy bear on these matters), she can create a scheduling problem for her parents, who must then work out who cares for Gracie at what times.

They share a need to, and an ability to, effectively and efficiently manage their time, whether using high-tech devices such as cell phones to communicate a need for updating, or simply using an “ad hoc” method of storing information in the head and “hoping for the best” with regard to possible scheduling conflicts.

Tools/Mediations used

They are also a techno-divergent couple, in that Lesley works around high-tech and is very comfortable with it. While she does not consider herself a “bleeding-edge” early adopter, she will definitely use technology that can be demonstrated to be useful to her.

Mike, on the other hand, is primarily responsible for the couple’s secondary business of boarding horses. He is often out in the pasture or the barn for long periods of time, and has a very take-it-or-leave-it attitude toward most technology. As a result, the couple currently “meets in the middle,” with Lesley relying heavily on her cell phone and Mike relying primarily on the answering machine at home to pick up messages regarding schedule changes. “Sticky” notes, bulletin boards, and the like aren’t used much, if at all. Lesley is a high-tech worker several miles from their home in semi-rural Santa Cruz Mountains. This means that Lesley may often encounter last-minute meetings, deadlines, or other “crunch” times in which her schedule changes radically and rapidly, and she will need to rely on Mike to care for Gracie. She says she would use something like Roamin’ Calendar except that she and Mike “...really don’t have many scheduling conflicts once things are set. It’s the early stages of negotiation and compromise that are the toughest for us.” The chart for this couple’s observed activities follows.

Appendices

Matt and Michael

Overview

This is a couple in which each is busy, with very independent and rarely concurrent schedules. About the only time schedules actually coincide for these two is on the weekends, and sometimes at meals — although even meals are not a “given” for being eaten together.

Matt is a high-tech worker who usually works up to 40 miles away in Silicon Valley. The industry is characterized by unpredictable schedules and last-minute demands on time. Matt can often call home to say, “I’m on my way!” and not actually be able to leave the office for another hour. However, Matt is a gadget-lover, swearing by his PDA, and eagerly adopts every bleeding-edge new electronic device. Michael, on the other hand, is on the verge of techno-phobic. Having had an unpleasant experience with a defective PalmPilot several years ago, he has since decided that any and all PDAs or PDA-like devices are untrustworthy and to be avoided at all costs. He does not and will not carry a cell phone, despite his very busy and very unpredictable schedule.

The situation is made more difficult for each, in that they are no longer a two-car couple, Matt’s car having recently been donated for tax purposes. This means that Matt must coordinate his need for transportation around the availability of Michael’s truck, and Michael must coordinate his possible need for immediate availability of transportation around Matt’s times of using the truck. It has created what the couple has termed a “scheduling nightmare.”

Tools and Mediations used

At present, the couple uses what can only be termed a “head in the sand” method of scheduling and reconciling times. Normally, schedules are not even discussed unless there is some pressing scheduling need that simply cannot wait or be rescheduled. If that’s the case, it’s usually followed by a lengthy negotiation phase until some mutually agreeable phase can be reached. However, last-minute changes can still make this sort of agreement ineffective and, similarly, there are several “strike while the iron is hot” moments of, “I don’t need the truck for the next two hours. If you have anywhere you want to go, do it now!”

This couple was not charted, because there really is no “typical” activity for this arrangement. However, we felt that this kind of impromptu and changes-by-the-minute (even during observation) situation would be a good candidate for Roamin’ Calendar.

Appendices

3) Informal Interviews

Tammy B. – informal interview with Pam Cote

Wednesday, 1/29

Tammy has seven children at home, five boys and two girls, ranging in age from one to seventeen. Tammy teaches adult ballet classes, and also attends ballerina classes.

Question: How do you keep track of family activities?

Answer: Calendar on the wall in the kitchen

Questions: Why do you keep a calendar?

Answer: To know where I need to be and when to pick up the children.

Tammy says she doesn't write recurring activities such as taking her son to basketball practice because it occurs every day. She had dropped him off for practice before coming to the ballet class, and needed to pick him up after.

She has had to rely on her husband to pick up a child on occasion, and two week earlier I witnessed a phone call from one son, which she received on her cell phone. He told her his ride hadn't arrived (Dad). Tammy commiserated with him, but couldn't leave for an hour to pick him up. She has a cell phone, but no PDA.

Katie Bakke – informal interview with Pam Cote

Tuesday, 1/14

Katie is married and has two children, 10 and 4. They don't have many outside activities. She keeps her family calendar in her day planner that she uses for everything in her life. She is an independent financial planner and an avid runner. Her business appointments and family activities and running times are all intermingled. She would be lost without her day planner. She uses it to track her family, her business, and her personal time. She has a cell phone, but no PDA. Since the day planner is meant to be a one-person tool, we can assume that Katie is in charge of the family activities.

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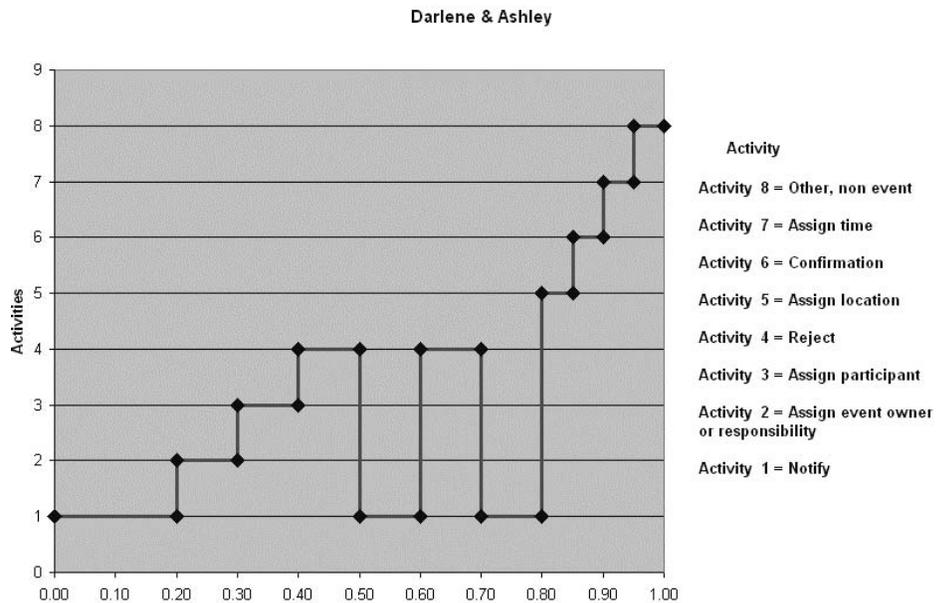
4) Annotated Transcripts and Graphs

Darlene and Ashley

Annotated Observation

Activities:

- 14:28 Ashley calls Mom and asks to go to a friends house
- 14:29 Mom identifies what Ashley wants to do
- 14:29 and that Ashley can walk to the friends house
- 14:30 Mom says “No”
- 14:30 Ashley makes her case
- 14:31 Mom says “No” have to be home to do your chores
- 14:31 Ashley argues that she can still do her chores
- 14:32 Mom identifies the location
- 14:32 Mom says okay, but Ashley has to be home by 4
- 14:32 Mom records the event and time Ashley must be home
- 14:32 Other, non-event conversation
- 14:33 End of call



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Lesley & Mike

Annotated Observation

1/30/03

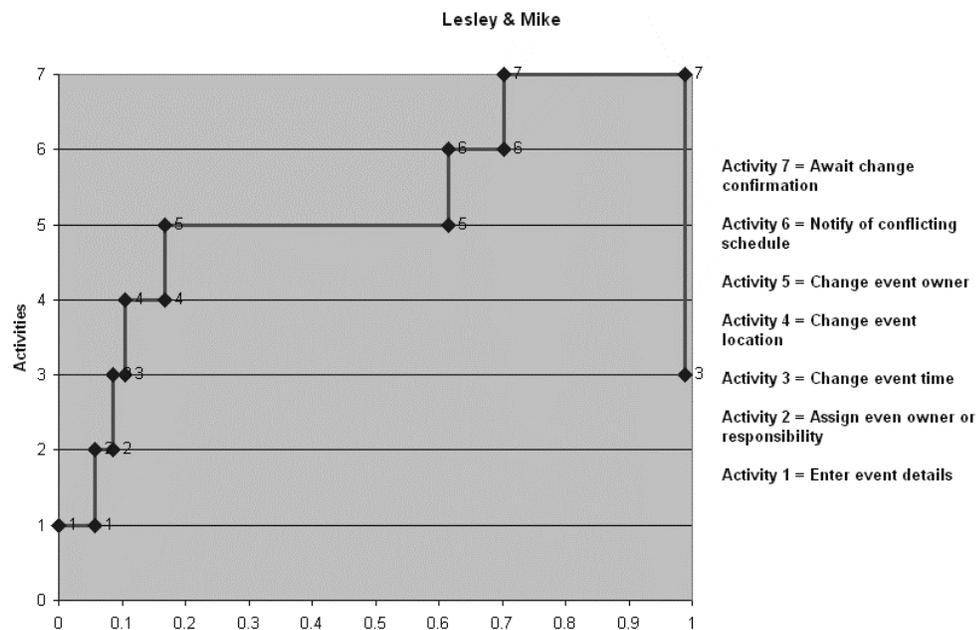
Goal: Lesley want to go to Borders bookstore & the Capitola Mall.
Plans to take Gracie with her.

Gracie must be home for nap, Mike needs truck. (4 p.m.)

Cutting it close — not leaving until 1:30 or so. Downtown Santa Cruz not bad, but Hwy. 1 to/from Capitola will be choked.

Activities:

- Lesley decides to go to Borders, writes down event (for me, wouldn't normally) – 1:42.
- Mike & Lesley agree that L. takes Gracie, about 5 minutes to get her ready.
- Planning to leave about 2:00 — leave right now to allow time for mall? (About a minute)
- Notify Mike that she wants to leave now. <1 minute
- Can't leave early; Mike needs truck. <1 minute
- Can one of them juggle times for truck? <1 minute
- What if Lesley skips mall and Hwy. 1 traffic?
- What if she leaves after Mike needs the truck at 4, and just goes downtown? Still a conflict?
- No, she'll have to make it an evening trip, and Mike can take Gracie.
- Give and take for several minutes. (~5 minutes)
- Lesley running late, informs Mike. (<1 minute)
- Schedule conflict with Mike. End



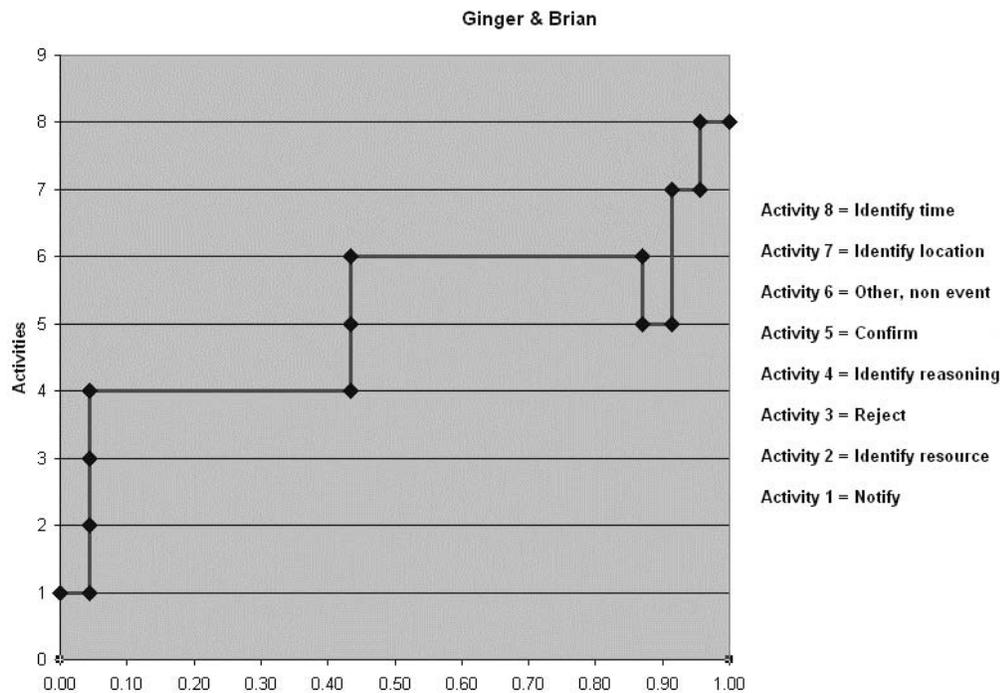
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Ginger and Brian

Annotated Observation

Activities:

- 5:00 pm Call mother to ask to take children for a while
- 5:01 pm Ginger expresses why she needs her mother to take the children for a ½ hour
- 5:01 pm Mother considering and ask why
- 5:02 pm Ginger establishes case for having her mother watch the children
- 5:10 pm Ginger's mother agrees
- 5:10 pm Ginger confirms with mother's agreement
- 5:20 pm Ginger bundles the children and walks them over to her mother's home
- 5:21 pm Ginger enters parents' home and confirms when she will pick up the children.
- 5:22 pm Mother confirms time for Ginger to pick up children
- 5:23 pm Ginger goes back to her house



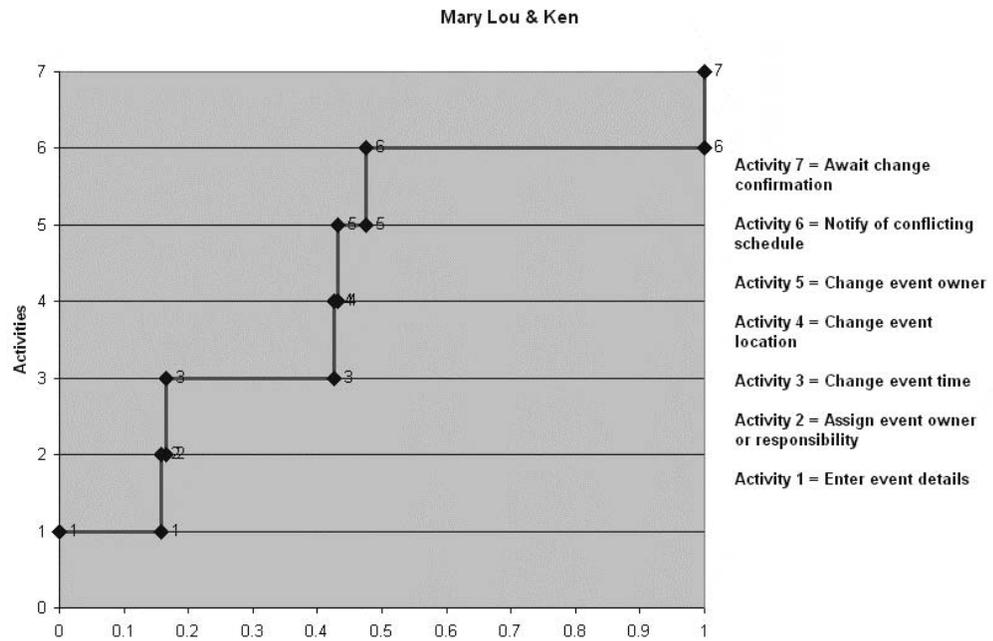
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Mary Lou and Ken

Annotated Observation

Activities:

- 11:09 Create Schedule Activity
- 11:10 Assign Owner/Responsibility
- 11:10 Change event: time
- 11:13 Change event: location
- 11:14 Change activity: owner
- 11:14 Notify of conflicting schedule
- 11:20 Await confirmation
- 11:20 End of Timed Observation



Appendices

5) Design Sources

1. ITPapers.com
(<http://www.itpapers.com/cgi/PSummaryIT.pl?paperid=252&scid=34>)-
[PDA](#)
2. DynIP Software (<http://www.dynip.com/main/ns/127/doc/82>)
3. Computer Parent Software (<http://www.computerparent.com/>)
4. WeSync (<http://www.wesync.com>)
5. FusionOne (<http://www.fusionone.com>)
6. “The unwired family” by Jørgen Sundgot
<http://www.infosync.no/show.php?id=3029>
7. Mom’s PDA <http://www.momspda.com>

6) Technology Sources

1. Wireless Developer’s Network <http://wirelessdevnet.com>
2. Wireless Developer’s Network Glossary of Terms
<http://www.wirelessdevnet.com/glossary/default.html>
3. Wi-Fi Alliance www.wi-fi.org

7) Marketing Sources

1. eBrain.Consumer Research, study conducted November 2002, Women,
Men & CE
<http://www.ebrain.org/content/CRS178.pdf>
2. Soon After Shipping PalmOS 5, PalmSource Discloses Details Of PalmOS 6
By Mitch Wagner interweek.com, Updated Wednesday, November 6, 2002,
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<http://www.internetweek.com/story/showArticle.jhtml?articleID=6400737>
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Another Try At True Anytime, Anywhere Wirelessness
By Robin Gareiss, InformationWeek
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4. Updated Thursday, January 9, 2003, 10:02 PM EST
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5. Growing Wi-Fi services cast wide Net
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6. Wireless sales quadruple while prices fall, By Richard Shim
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<http://zdnet.com.com/2100-1103-983684.html>

7. Wireless: It's raining By Ben Charny
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<http://zdnet.com.com/2100-1103-983583.html>

Note: all URLs were accurate at the time of publication of this document.