A Survey of Personal and Household Scheduling Practices: Implications for Digital Family Calendars

A.J. Bernheim Brush and Tammara Combs Turner
Microsoft Research
One Microsoft Way
Redmond, WA 98052-6399

{ajbrush, tcombs}@microsoft.com

ABSTRACT

We surveyed employees at a technology company in May of 2005 about how they manage personal and household scheduling. We found that 51% of 621 respondents primarily used their digital calendar at work for managing household events. Several themes emerged as important to respondents including: a desire to have a single place for all calendar information, a need for constant access and wish to easily coordinate household schedules. Respondents' challenges in using digital calendars and the reasons some respondents use paper calendars provide insights into how digital calendars could be improved to better meet the needs of families.

Categories and Subject Descriptors

H.5.3 Group and Organization Interfaces

General Terms

Human Factors.

Keywords

Digital calendar, groupware calendar systems, family, home, personal, domestic life

1. INTRODUCTION

"Are we free for dinner with friends next weekend?" "Can you pick up the kids when I have to work late on Tuesday?" "When is a good time to take a family vacation?" These seemingly innocent questions strike at the heart of how people manage their personal time. Families or any multi-person households are prime examples of small groups that need to coordinate their schedules to get people to the right places at the right time. As anyone who has ever experienced a scheduling mishap of double booking or even just struggled to synchronize a work and home calendar knows, scheduling for several people can often feel more difficult than it needs to be.

As the first step in understanding the design space for digital family calendars we sought to study how people manage their personal calendars, particularly families with children. On the surface, it seems that a groupware calendar system aimed at families might offer several advantages to busy families. For example, members of the family could view the calendar from work or another location outside the home. In fact, several commercial systems exist (e.g. [1, 7, 12, 16, 19]) to aid in this effort. However, previous research has primarily found that people, even those who spend considerable time using a computer, use paper calendars [8].

In this paper we describe the results of a survey of employees at Microsoft Corporation about how they manage their personal scheduling and coordination. Our six hundred and twenty-one survey respondents are precisely the people that might be most likely to adopt technology based solutions such as a digital family calendar for managing family scheduling. The employees of Microsoft are familiar with technology and each of them uses a Microsoft Outlook digital calendar for their work schedule. Understanding how the households of these employees manage their personal schedules including their adoption or lack of adoption of digital calendars provides insights into how digital calendars could be improved.

Our research questions focused on three areas:

1) **Scheduling Methods**: What methods do people use to manage their personal and household schedules? This information provides a baseline from a very technology savvy population and can also be compared with previous family calendar survey research conducted by the University of Maryland [8, 14].

2) **Scheduling Challenges**: Is personal and household scheduling perceived as challenging, particularly by families? Previous research [e.g. 15] suggests the most scheduling challenges are faced by families with children, so we recruited people from a diversity of living situations for the survey to test this and also explore if any common challenges emerged.

3) **Technology Usage**: How does technology in the home impact the use of different calendaring solutions? For example, are respondents with computers in their kitchens more likely to use digital calendars?

Contrary to previous research, which found that most people were using paper calendars, 51% of our respondents were using the Microsoft Outlook calendar provided through Microsoft for work related scheduling as their primary personal calendar as well. Of the thirty-eight percent of respondents whose families primarily used paper calendars for scheduling most were couples with children and only one parent working at Microsoft.

Our contributions include an in-depth picture of personal scheduling methods from a large population, and in particular the challenges they face in scheduling. The results of our survey highlighted several themes including the preference of many respondents to have both work and personal calendar information available in a single location to prevent scheduling problems, the desire for constant access to the calendar, and need to easily share

calendar information with others in the family. Challenges faced in sharing information and privacy concerns described by respondents using their work calendar suggest ways digital calendars could be improved to better meet the needs of families. Reasons given by respondents for using paper calendars including the nice appearance of paper calendars, also suggest enhancements for digital calendars.

We, of course, recognize that our respondents represent a very particular group of people. They all work for the same company, they are likely relatively well off financially\, and are very likely to be comfortable with technology. However we believe studying how they and their households manage their personal scheduling is a reasonable place to begin as the familiarity of respondents with technology makes them some of the most likely users of digital family calendars (either currently or in the future).

In the rest of the paper, we first discuss related work. We then describe the survey in more detail. Section 4 outlines our results. We close with a discussion of our results and implications for the design and implementation of digital calendars.

2. RELATED WORK

Exploring how people manage the balance between work and home has received considerable attention in recent years. Two in-depth ethnographic studies are the work of Nippert-Eng and the Silicon Valley Cultures Project. In her book, Home and Work, Nippert-Eng [11] examines in detail how people manage boundaries between home and work, describing the continuum between people that highly integrate home and work and those people that highly segment home and work activities. Most relevant to our research on personal scheduling, Nippert-Eng found "[t]he number and type of calendars someone uses is one of the most telling indicators of where she or he falls along the integration-segmentation continuum." [11, pg. 43].

The Silicon Valley Cultures Project [5] conducted an extensive ethnography of twelve dual career families living in the Silicon Valley studying the interaction between family and work. While providing a unique picture of working families they also highlight a considerable amount of integration between work and home among families they studied. While exploring boundary management was not the focus of our survey, our data provided examples both of people integrating home and work and trying to maintain a separation. We also studied the number of calendars our respondents maintain and how much personal information people incorporate on their work calendars.

Several research projects in the United Kingdom have focused more directly on understanding everyday challenges and behaviors in the home to inform the design of new technologies. In [4], Crabtree and Rodden describe findings from several projects exploring domestic routines in the home and the implication for designing technology for the home. They stress the system of communication in the home and identify key places of action including ecological habitats, activity centres and coordinate displays.

A study by Beech et. al [2] explored the lifestyles of working parents through interviews and a survey, and concluded with a number of possible technologies that would improve the lives of working parents including household management and coordination software, and family awareness. In a follow-up study, Sellen et. al [15] focused specifically on everyday problems for working parents. Most relevant to our research they found

remembering activities the family needed to do and handling last minute changes to plans were some of the toughest challenges to overcome.

Two other related ethnographic studies by Taylor and Swan [17, 18] examine mothers' work in the home and introduce the notion of "organizing systems", which capture, integrate, arrange, and convey information through the use of artifacts such as calendars, to-do lists, and paper notes. Taylor and Swan suggest that any systems for the home must allow combining heterogeneous devices, support flexible systems of organization, and integrate with established organization systems. Our data provides a complementary picture focusing explicitly on artifacts for scheduling among a larger set of household with the tradeoff of self-report data instead of ethnography.

Turning to more specifically to research on calendars, Palen and Grudin [13] studied adoption of digital calendars in the workplace and Tullio et al [20] has built Augur, a shared personal calendar for workgroups. Several commercial products also aim to help families schedule including Family Scheduler [7], OurFamilyWizard [12] marketed to divorced parents sharing custody, and Trumba [19] which offers a service primarily aimed at Windows users that is similar to Apple's ical service [9] for publishing and consuming group calendars.

Two research projects exploring calendaring for the home include work by Crabtree, Hemmings, and Mariani [3] as part of the Equator project [6] and the research conducted by the University of Maryland as part of the interLiving Project [10]. From their fieldwork in 22 homes, Crabtree, et al. drew out specific design recommendation for Groupware Calendar Systems for the home. Their findings include the importance of access to the calendar from anywhere at anytime, and supporting the ability to negotiate scheduling through the calendar. Our research provides a chance to gather data from a larger number of respondents in a different country and see if similar themes emerge.

Our survey research is most similar to the Family Calendar Survey [8] conducted by researchers at the University of Maryland in 2002 to inform their design on technologies for families. They had over 400 responses and found that their respondents relied on multiple calendars most of which were paper, even though 70% used a computer more than 30 hours per week. Similar to Taylor and Swan, they found women play an important role in scheduling and when a single person maintains the calendar it is likely to be a woman. Informed by their survey and a participatory design process, Plaisant et. al [14] built a shared family calendar system and studied it with three households in the same extended family. Despite technical challenges, the calendar system appeared to provide a useful way for the grandparents to stay aware of activities of younger family members.

Our survey builds on the Family Calendar Survey and we are grateful to the researchers at University of Maryland for providing their survey questions and allowing several to be included in our survey to facilitate comparisons. In our survey we have focused in greater detail on the relationship between work and personal scheduling, scheduling challenges, and the types of technology respondents have in their homes. We also worked hard to recruit respondents with children. Sixty-five percent of our respondents had children in their household compared with 28% of the respondents to the University of Maryland survey. We believe this

gives us additional insights into scheduling among the people we anticipate will have the most challenges.

3. SURVEY

We conducted our survey in May of 2005. In this section we discuss the survey questions in greater detail and describe how we recruited our respondents.

3.1 Survey Questions

Our Personal Calendar Survey consisted of four sections: Demographics, Scheduling Solutions, Scheduling Challenges, and Technology Usage. The Demographics section questions focused on the make-up of the respondent's household. In the Scheduling Solutions section, we asked questions about the calendar or calendars respondents and their household members use for scheduling personal events. This section also asked respondents about their work calendar, in particular how much if any personal information they included on their work calendars. The questions in the Scheduling Challenges section explored challenges respondents experience related to scheduling and coordination for themselves and their household. The final section on Technology Usage asked questions about technology the respondents used at home and on the go.

The survey included different questions based on the number of people in a respondent's household, whether the respondent was single or in a relationship, and what type of calendar (e.g. paper or digital) a respondent used as the primary calendar where most of their personal and/or household events (e.g. dinner with friends, kids events, etc) are recorded. The Appendix contains the text and raw results from the survey.

We analyzed the survey data using the SPSS statistical software package. For the comment responses, two researchers individually coded the comments and then resolved any disagreements through discussion.

3.2 Recruiting Strategy

We surveyed employees using a snowball sample technique. Our goal was to have responses from people in a variety of living arrangements while ensuring that we received a considerable number of responses from households with children. Therefore we initially invited members of Microsoft's new mothers and working parents email distribution lists to participate, but we encouraged them to forward the survey to other colleagues. We also sent the survey to our work division's mailing list and asked several colleagues across the company to forward the invitation to their organizations. As a counterbalance to the snowball approach, we randomly selected 1000 employees from the company address book and requested they fill out the survey.

Although this approach makes it impossible to report response rate, the initial lists where we know the survey request was sent had a total of approximately 3760 people (this includes the 1000 people randomly selected). We believe the survey request was actually forwarded to many more people due to feedback we received. The survey was open for 6 days, during which we received 621 responses.

We made the survey anonymous due to the potentially sensitive nature of our questions about household demographics. However, in order to participate in a sweepstakes for one of 10 $25 gift certificates to Amazon.com, respondents needed to provide an email address at the end of the survey. Our privacy policy on the survey made it clear we took survey anonymity very seriously.

We did not associate email addresses with the survey data and we deleted the email addresses after the sweepstakes was completed. In the end, 598 of the 621 respondents provided their email addresses so the data may not have been as sensitive as we originally feared.

4. RESULTS

We now describe the results of the survey.

4.1 Demographics

Of our 621 respondents, 332 (53%[1]) were male, 279 (45%) were female and 10 (2%) opted not to disclose their gender. Respondents primarily lived in the United States (549, 88%), mostly in the state where the headquarters of the company is located (491, 79%). We also had 70 (11%) international respondents and 2 respondents that did not disclose their location.

As Table 1 shows, our recruitment strategy was successful and we received responses from people in a variety of living situations with an emphasis on couples with children. Overall, 65% (406) of our respondents lived in households with children. For the 507 respondents that self-identified their family status as couple (married, domestic partner etc), 65% (330 of 507) resided in dual career households where their spouse or partner worked outside the home, most for 40 or more hours a week. As Table 1 shows, 103 of respondents in couples reported that their spouse or partner also worked at Microsoft, so there is a non-trivial possibility that we have data from two members of the same household in our sample.

We had 148 respondents in single career households with spouses or partners that do not work outside the home and 29 respondents that chose not to answer the question about whether their partner or spouse worked so we included in them in the single career household count in Table 1 for a total of 177 single career households.

4.2 Personal and Household Calendars

Our respondents reported using a median of 3 different calendars (paper and digital combined) at least once a week for their personal scheduling information. There was a significant different in the calendars used per week by respondents with kids (median = 3) and without (median = 2) based on a Mann-Whitney U test, $z = -6.41$, $p < 0.0001$. Respondents also reported that of these calendars, one was digital (median response), which we presume most likely to be the respondent's work calendar.

Table 1: Households of our survey respondents.

	Not spec.	Single (N, %)	Couple (N, %)			Total
			1 Career	2 Career	2 MS	
No Kids	3 (33%)	77 (73%)	39 (22%)	62 (27%)	34 (33%)	215 (35%)
Kids	6 (67%)	28 (27%)	138 (78%)	165 (73%)	69 (67%)	406 (65%)
Total (N, %)	9 *(1%)*	105 *(17%)*	177 *(28%)*	227 *(37%)*	103 *(17%)*	621 *(100%)*

When asked about all the types of calendar respondents used for recording personal and household events (respondents could mark more than one), the most popular types were a PC-based calendar (568, 75% of respondents), wall calendar (389, 63%), notes on paper (228, 37%), cell phone (171, 28%), PDA (151, 24%), and pocket calendar (106, 17%).

We then asked respondents to tell us more about the "calendar where most of [their] personal and/or household events are recorded." Our first expectation, informed by previous research, was:

Personal and household scheduling is primarily done using paper calendars, except by single-person households who will use their digital calendar provided by work for both personal and work-related scheduling.

Much to our surprise, we did not find any support for this expectation. Of our respondents, 59% (368) told us they used a digital calendar as their primary personal calendar. A majority of these respondents were using their Microsoft Outlook digital calendar provided by Microsoft (86%, 317 of 368) as their primary personal calendar. The remaining 14% (51 of 368) of those using other digital calendars were primarily using self-hosted Outlook (15 of 51), or a Pocket PC/Palm Pilot (15 of 51).

Paper calendars were the primary method for 38% (233) of our respondents. These calendars were most often located in the home kitchen (67%, 156 of 233) and most often wall calendars (71%, 166) rather than pocket (15%, 36) or desk (10%, 25) calendars. Twenty respondents (3%) told us they did not record personal items on a calendar.

Table 2 shows the primary type of calendar used based on the family situation of the respondents. The bold text in each line highlights the calendar type used by the highest percentage of households of that type. The households with the highest use of the digital calendar provided by Microsoft were those in two career couples where both people worked at Microsoft (76% of respondents without kids and 68% of respondents with kids) or had no kids (69%). The respondents with the highest use of paper calendars were those with kids in one career families (49%), two career families where their spouse or partner did not work at the same company (47%) and single people with kids (47%). However, in these three household types there is still greater usage of digital calendars compared to paper when one considers the number of households using other digital calendars.

We had expected that single respondents would use their work digital calendar since they potentially had fewer household members and no spouse, with whom to coordinate. However, we were somewhat surprised that single respondents with children also were among the respondents most likely to use paper (47% of single respondents with children), although 50% of single respondent with children did use their work digital calendar as their primary personal calendar.

4.2.1 Reasons for using Work Digital Calendar

We asked respondents to select reason(s) they use their Outlook digital calendar for scheduling personal events and gave them the following options (respondents could mark more than one): "Easy for different people to view and edit", "Accessible from multiple locations", "Easy to synchronize with work calendar", "Other" and "None." Eighty-one respondents used the other option to provide additional comments about why they use their work calendar as their primary personal calendar.

Table 2: Calendar most often used for personal and household scheduling by respondent's household type.

Household Type (N)		Paper	Digital Work	Digital Other	Not record
Single/ unknown	No Kids (80)	23 (29%)	**47 (59%)**	2 (3%)	8 (10%)
	Kids (34)	16 (47%)	**17 (50%)**	0	1 (3%)
Couple, No kids	1 career (39)	12 (31%)	**19 (49%)**	4 (10%)	4 (10%)
	2 career (62)	15 (24%)	**43 (69%)**	3 (5%)	1 (2%)
	2 MS (34)	5 (15%)	**26 (76%)**	2 (6%)	1 (3%)
Couple, Kids	1 career (138)	**68 (49%)**	46 (33%)	23 (17%)	1 (1%)
	2 career (165)	**78 (47%)**	72 (44%)	13 (8%)	2 (1%)
	2 MS (69)	16 (23%)	**47 (68%)**	4 (6%)	2 (3%)
Total		233	317	51	20

The most popular reason was "Easy to synchronize with work calendar" selected by 76%, (240 of 317 possible) respondents. This idea of having all calendar data synchronized or in a single place was also mentioned most frequently in the comments (25 mentions). Representative comments include: "I NEVER double-book my work and home life, since it is all kept on the same calendar.", "I don't want to have to maintain separate work and personal calendars.", and "Need to keep everything together or something gets forgotten and double bookings occur."

The next most popular reason for using the work digital calendar as the primary personal calendar was "Accessible from multiple locations" selected by 259 respondents (72% of 317 using work digital calendars). Fifteen comments described the value of having constant access to their calendar in their comments. For example, "I use outlook for my calendar so all calendar information is on my mobile phone/pda.", and "Easily transferable to my PDA and helps me keep in sync even when offline." By contrast only 26% (84) felt their work calendar was easy for different people to view and edit, although 6 respondents did cite this reason in their comments.

In the comments, other frequently mentioned positive reasons were the benefit of reminders (18 mentions) and the convenience of using Outlook (13 mentions), typically because the person already spent significant time using his or her work calendar. Other less popular reasons that were mentioned by more than 4 respondents included: capability of editing appointments, the safety of data on the server, and use of meeting invites for scheduling.

4.2.2 Reasons for using another Digital Calendar

The 51 respondents using another digital calendar were also asked to specify why they use a digital calendar for scheduling personal events. The most popular reason for this group was "Accessible

from multiple locations" (32, 62%), again cited often in comments as well (8 of 20 comments). Comments included: "I bring it with me everywhere I go.", and "it's always with me." The next most popular reason was "Easy for different people to view and edit" (25, 49%) and then "Easy to synchronize with work calendar (17, 33%).

Compared to those using the work calendar the major difference was that allowing different people to view and edit was more popular (potentially because of less severe security constraints). Again, the value of reminders was mentioned in comments (5 of 20 mentions), as well as editing (4 mentions), with less of a stress on convenience (3 mentions).

4.2.3 Reasons for using a Paper Calendar

We asked respondents using paper calendars why they used paper calendars and gave them the following options (respondents could mark more than one): "Easy to use", "Accessible in a central location (e.g. kitchen)", "Portable", "Always available (e.g. no need to turn on)", "Can be personalized", "Can be saved as a reminder of what we did (e.g. memories)", "Other" and None".

The most common reasons selected were "Easy to use" (88%, 204 of 233 possible), "Always available" (83%, 193), and "Accessible in a central location" (79%, 184). These were also cited in comments, for example: "It's much easier to scribble in an entry than data enter into a PDA. It's also much easier to browse.", "I like the flexibility and visibility of it (hanging in kitchen, no need to turn it on)", and "It's easy to use. I don't have to turn it on or worry about batteries running down or worry about someone stealing it."

Less popular reasons from the provided options were "can be saved as a reminder of what we did (e.g. memories) (28%, 66), "portable" (24%, 57) and can be "personalized (e.g. different colors for different kids)" (22%, 52). However, the calendar as a place for memories and the ability to personalize the calendar were both mentioned in more than 10 comments. Representative comments include: "a good record of what went on", "permanent record of activities", and "I also like to color code things."

Additional positive reasons for using a paper calendar mentioned frequently in comments included: not involving technology, the calendar being nice looking (e.g. including art or family photos), and providing a good overview of the schedule information (e.g. in a monthly view).

4.3 Work Calendars and Personal Data

Since all our respondents work at the same company we were interested in whether the amount of personal information respondents included on their work calendars affected whether they shared their calendars with co-workers. It is of course possible to mark events as personal, but this seems like it would require considerable effort for those putting many personal items on their work calendars. Our second expectation was:

People putting considerable amounts of personal information on their work calendars will be less likely to provide colleagues access to their calendar.

Overall, respondents reported putting "some personal or household events" on their work calendar (median response). In contrast, as would be expected, the median response for respondents using the work calendar as their primary personal calendar was that they put "All personal and household events" on their work calendar. Although most respondents use their work-

provided Microsoft Outlook calendars for scheduling some personal events, women were more likely to use their work calendar (54%) for personal use than men (49%).

We asked respondents what types of personal events respondents include on their work calendar. The most popular responses (respondents could mark more than one) were "Personal/Household appts" (92%, 568) and Personal reminders (76%, 472). Other popular options selected were Personal/Household social events (64%, 396), Birthdays (59%, 364), Family/Friend vacation days (54%, 335) and Personal Tasks (54%, 334). It is important to note that Microsoft company policy does explicitly allow for storing personal calendar information on company provided resources, although as is probably typical of most businesses, the company reserves ownership and access rights to anything stored on those resources.

Calendars at Microsoft are set by default to only show other people in the company whether the calendar owner is free or busy, rather than complete details of events. Many of our respondents kept this setting (59%, 365). However, 24% (149) of respondents shared their calendar details with a few people, 6% (40) shared with most people and 11% (67) of respondents had opened the details of their calendars to the whole company. We found that men were more likely to share the details of their calendar (21%) with most or all of the company's employees than women (11%).

We found it somewhat surprisingly that the respondents most likely to open their calendars to others were those using Outlook as their primary calendar. Forty-nine percent of them (154 of 317) gave some type of access to their calendar details and 14% (44) using Outlook as their personal calendar shared out their calendars to everyone at the company (accounting for 66% of respondents that share with everyone).

We asked the respondents who use paper calendars as their primary personal calendar about whether they share the paper calendar and the number of work events on their paper calendar and found essentially the opposite behavior compared to use of the digital work calendars. Paper calendars were highly likely to be shared among multiple people, 75% (176) of respondents using paper calendars reported their calendar was shared by 2 or more people (including themselves). People using paper calendars for personal and household scheduling included relatively few work related events on their calendars: 37% (86) included no work items, 45% (105) included some work related events, 9% (20) included all work related events during non-business hours, and 5% (11) all work related events.

4.4 Calendar Management

Previous research [8, 17, 18] has found that in families women tend to be the central organizers of the home. We were interested in whether this finding was also true for dual career households. Our third expectation was:

In dual career households, responsibility for scheduling is divided more evenly between the adults compared to single career households.

We asked respondents in households with more than one person, to specify how often each person (including themselves) adds events to the primary personal/household calendar, on a scale of "N/A", "Never Add", "Occasionally Add", "Often Add," or "Mainly Add." The median response for respondents who are part of a couple was that they "Mainly Add" events to the

calendar. In contrast, for the 257 respondents that reported how often their partners added events, the median was "Never Add."

To see if women had more of a role in calendar management we compared median responses for how often the respondent added events to the primary calendar by gender. The median for men respondents was "Often Add" while for women the median response was "Mainly Add." These medians are significantly different based on a Mann-Whitney U test, $z= -9.39$, $p < 0.0001$. The median response for partners of men respondents was also that they "Often Add" suggesting a potentially more even division of labor compared to the median response of "Occasionally Add" for partners of women respondents. These medians are significantly different based on a Mann-Whitney U test, $z= -4.23$, $p < 0.0001$. For our respondents, it appears that the women are taking on more of the calendar maintenance.

To explore how much sharing was occurring in each household, we compared how often the respondent and his or her partner added events to the calendar. We considered the household to have shared responsibility for the calendar if the respondent and partner both added events the same amount (e.g. a "Mainly Add" answer for both respondent and partner) or there was only one degree of different between the answer for the respondent and partner (e.g. a "Mainly Add" answer for one and "Often Add" for the other). Otherwise we considered the calendar to be maintained by a single person, either the respondent (e.g. a "Mainly Add" answer for respondent and "Never Add" answer for spouse) or his or her partner (e.g. an "Occasionally Add" answer for respondent and "Mainly Add" answer for spouse).

For the 495 respondents that gave answers for themselves, their partners or both, we found that 143 (29%) shared management of the calendar and 352 households (72%) had primarily a single maintainer. The single maintainers (either respondents or partners) were more likely to be women (65%, 230 of 352) than men, although this is considerably less than the 90% of single maintainers being women that Hutchinson et al. found in their survey [8].

We also compared sharing of calendar management by single career couple and dual career couples. We found no support for our expectation that calendar management would be more shared among dual career families. Seventy-two percent (236 of 330) of our respondents in dual career families had a single maintainer which was very similar to single career families where 68% (116 of 171) had a single maintainer.

Lastly we looked at how the type of primary calendar might affect who manages the calendar. Again, management of the calendar was not typically shared. Respondents with families using paper calendars were the most likely to share responsibility for managing the calendar although only 35% (67 of 191 couples using paper) of them shared management, compared to 23% of couple using Outlook and 25% of those using another digital calendar.

Perhaps the most interesting gender related finding was that paper calendars that were maintained by a single person were overwhelming maintained by women. Of the 124 people maintaining paper calendars 89% were female (110 of 124). This is quite similar to the 90% of women single maintainers reported by in the University of Maryland survey [8]. Note, this calculation looked at the gender of the maintainer of the calendar regardless of whether it was the respondent or his or her partner.

4.5 Negotiation

One of the main findings of Crabtree et. al [3] was the importance of the calendar for negotiation. To better understand how our respondents negotiated household scheduling, we asked respondents in households with more than one person about how they negotiated scheduling with other members of their households (e.g. with their partner or children). The most popular methods for negotiating (respondents could mark more than one) were face-to-face conversation (83%, 518 respondents), phone (72%, 444) and email (64%, 397). Then there was a big drop-off with instant messenger (IM) selected by only 32% (200) of respondents. When asked about the primary method used to negotiate scheduling, face-to-face conversation was clearly the preferred method selected by 332 respondents (53% of 621) with phone a far distance second at 17% (106).

Exploring the data by household type, we saw only two interesting differences. First, all household types had more than 50% of respondents selecting email as a common way to schedule, except for single parents where only 41% of respondents felt email was a common way to schedule. Second, while IM was generally not a common way that respondents negotiated scheduling, it was more popular for respondents in couples that both worked at Microsoft (58%, 60 of 103 respondents).

4.6 Scheduling Challenges

To explore whether calendaring and managing schedules was a challenge for respondents we asked them several questions about how many and what types of calendars they maintain, how they deal with uncertain (or tentative) events and whether they perceived scheduling non-work related events during work hours as a challenge. Although the majority of our survey respondents were satisfied (median was "Somewhat Satisfied") with their current method of scheduling household events, there are still challenges that families face in keeping their households running smoothly.

Respondents reported spending on average between 30 minutes to an hour per week managing their personal and household calendars. Single adults with no children and one-career couples spent less than 30 minutes each week scheduling events. When asked how often scheduling "mishaps" occurred, for example scheduling multiple events for the same time or forgetting to put an event on the calendar, the median response across all groups was "Rarely" (46%, 287). We found it interesting that although single parents spent just as much time scheduling events for their families as two career couples, they have scheduling mishaps more often, "about once per month" (38%, 13).

We asked respondents, "What challenges, if any, do you have in scheduling for yourself and your household?" Table 3 shows the percentage of respondents (by household type) that reported each of the challenges (respondents were asked to mark all that applied). The top three challenges overall were "Forget to write things on a calendar" (62%, 382), "Difficult to access calendar(s) from other locations" (50%, 312), and "Hard to keep track of the schedules of other members of my household" (43%, 267). Male and female respondents alike experienced challenges in remembering to record events on their calendars, but men found keeping track of the schedules of other household members (50% of men and 35% of women) and accessing calendars from other locations (53% of men, 48% of women) to be bigger challenges.

Table 3: Scheduling Challenges by Household Type. The table shows the number (%) of each household type that specified they faced the particular challenge. Respondents could select all challenges that applied.

Challenge	Single/Other		1 Career Couple		2 Career Couple		2 Career Couple		Total
	No Kids	Kids	No Kids	Kids	No Kids	Kids	No Kids	Kids	
1. Forget to write things on a calendar	45 (56%)	21 (62%)	25 (64%)	89 (64%)	32 (52%)	105 (64%)	16 (47%)	49 (71%)	382 (62%)
2. Difficult to access calendar(s) from other locations	19 (24%)	12 (35%)	20 (51%)	87 (63%)	26 (42%)	103 (62%)	10 (29%)	35 (51%)	312 (50%)
3. Hard to keep track of the schedules of other members of my household	14 (18%)	12 (35%)	19 (49%)	72 (52%)	28 (45%)	85 (52%)	7 (21%)	30 (43%)	267 (43%)
4. Too many calendars to duplicate information across	15 (19%)	10 (29%)	12 (31%)	58 (42%)	24 (39%)	67 (41%)	6 (18%)	21 (30%)	213 (34%)
5. Too many calendars to maintain	12 (15%)	16 (47%)	10 (26%)	57 (41%)	25 (40%)	61 (37%)	1 (3%)	20 (29%)	202 (33%)
6. Hard to deal with uncertain events	20 (25%)	15 (44%)	9 (23%)	51 (37%)	17 (27%)	42 (25%)	9 (26%)	21 (30%)	184 (30%)
7. Difficult to move or change events once they are placed on the calendar	10 (13%)	7 (21%)	9 (23%)	44 (32%)	7 (11%)	44 (27%)	3 (9%)	10 (14%)	134 (22%)
8. Complicated to schedule non-work events during work hours	12 (15%)	8 (24%)	7 (18%)	34 (25%)	8 (13%)	24 (15%)	2 (6%)	10 (14%)	105 (17%)
9. Complicated to schedule work events that occur during non-work hours	6 (8%)	5 (15%)	6 (15%)	21 (15%)	6 (10%)	22 (13%)	2 (6%)	9 (13%)	77 (12%)
10. Flexible work schedules	5 (6%)	5 (15%)	5 (13%)	14 (10%)	9 (15%)	24 (15%)	0 (0%)	10 (14%)	73 (12%)
11. Other	15 (19%)	1 (3%)	4 (10%)	18 (13%)	7 (11%)	16 (10%)	4 (12%)	14 (20%)	79 (13%)

In reviewing the comments about common challenges, participants described paper calendars as "difficult, messy to move or change events" once they had already written the event on the calendar (19 participants mentioned this) and "not [having] enough room in the calendar spaces" (mentioned by 22 participants) to record the details of the event. They also reported that paper calendars were hard to share with others (18 mentions), impossible to access when they were away from the calendar (21 mentions), and hard to synchronize with other calendars they had household events recorded on (16 mentions).

Several comments also related to the options participants chose in Table 3. Those who used paper calendars reported they had too many calendars to maintain (12 mentions) and sometimes forgot to write events on the calendar (11 mentions) or even look at the calendar (11 mentions). A representative comment by a respondent using a paper calendar was, "Wall calendar is a vital tool for the family and like to see a month at a time, but the space is too small to write everything in that we need to see. Also, often hard to integrate information by looking across all of the different calendars we own (in all their formats)."

Having a digital calendar addressed many of the concerns of paper calendar users. However, some of the challenges were the same despite the medium of the calendar. Digital calendar users noted in their comments that they found it difficult to share calendars (25 mentions), and found the lack of remote access difficult (13 mentions). In addition, they mentioned the problem of synchronizing calendars across devices and other calendars (17 mentions). With digital calendars it became apparent from respondent comments that privacy is something people are concerned about (17 mentions) – from the level in which they share the details of their calendar to the server on which their calendar information is stored.

Technology aversion was an issue for spouses and other household members of the respondents of the survey. From the comments we learned that some households still depend on paper calendars because they do not crash, data does not have to be backed up and the calendar does not have to be turned on.

4.7 Technology Usage

To study potential barriers to adoption for digital calendars we were interested in how our survey respondents use technology in their homes. As we expected, our respondents spend considerable time using computers with 506 (81%) reporting more than 40 hours of use per week. Other people in the household also appear to spend considerable time using technology. For households with more than one person, the median response was that a partner or other family member used a computer 31-40 hours a week.

Our respondents have many computers in their homes. Respondents reported more than 1,758 personal computers in their homes (including laptops brought home from work). The median number of computers per household was 3, (scale: 0, 1, 2, 3, 4, 5+ computers), with 105 respondents (17%) reporting 5 or more computers at home. We also looked at the relationship between household size and number of computers. For households of sizes 1, 2, 3, the median number of computers was equal to the size of the household, suggesting there might be relatively little need to share computers. Households of size 4 and 5 had a median of 3 computers while respondents with 6 or more people in their households had a median of 4 computers. Of course, our respondents all work at a technology company and so the number

Table 4: Locations of computers in respondent's homes.

Location	# of households	# of computers
Home Office	436 (70%)	693
Mobile Laptops	371 (60%)	580
Bedroom	125 (20%)	168
Family Room	98 (16%)	117
Living Room	88 (14%)	108
Kitchen	61 (10%)	64
Other (e.g. dining room, garage, attic, closet)	100 (16%)	121

of computers in their households is most likely much higher than for the general population.

Our respondents were also very well connected to the Internet with only 11 respondents (2%) without any connection. Most respondents have a Cable Modem (301, 49%) or DSL (254, 41%) connection. Access to a wireless network was also surprisingly high with 78% (486) having wireless access at home. The advent of wireless home networks suggests it would be much easier to place a computer in many different locations in the home (including the kitchen) and have constant access to a computer with internet access.

Many respondents and their households were also well connected to the internet while on the go. While most households (96%, 596) reported having one or more cell phone, 43% (270) of households reported having one or more cell phones with activated internet access (this includes smart phones). We also asked respondents about Pocket PCs and other PDAs and 63% (396) of households had one or more of these mobile devices, however only 19% (115) of the households had internet access for their devices.

Ethnographic data from Crabtree and Rodden [4] and our survey data shows that high-traffic rooms (like kitchens) are typically places for communication media such as calendars, so we were interested in where households locate their computers. Our fourth expectation was:

Households with computers in the kitchen would be the most likely to use digital family calendars.

As Table 4 shows, for our respondents, the most popular room in the home for computers was the home office. The second most common location was not a location at all, but the use of a mobile laptop. We found that only 61 (10%) of respondents had computers in their kitchens, a number we found surprisingly low. However, of course we do not know if any of the laptops may spend considerable time in the kitchen. Of respondents with kitchen computers, more than half (38, 62%) used a digital calendar as the place where most of their personal and/or household events were recorded, 30 using the digital calendar provided through their work and 8 another digital calendar. For our respondents, households with computers in the kitchen were not any more likely to use digital family calendars since 62% is not considerably different than the 59%, the   percent of respondents overall using digital calendars

5. DISCUSSION
Several themes about how people manage their personal and household scheduling emerge from the survey results, in

particular: a desire for constant access to calendar information, the value of a single place for all calendar data, and the need for scheduling and sharing with others (typically for couples).

5.1 Desire for Constant Access
The ability to constantly have calendar information at hand was seen as an advantage both by people using digital calendars and those with paper calendars. Of respondents using digital calendars "Access from multiple locations" was selected as one of the top benefits (72% of those using Outlook and 62% of those using other digital calendars). Many respondents using digital calendars commented on the value of Pocket PCs or Smart Phones for taking their calendar information everywhere with them. Several respondents using paper calendars that could be carried with them also commented on the value of having the calendar always with them.

Also showing the desire for constant access, respondents using both digital and paper calendars cited lack of access to their calendars as a problem. Overall 50% of respondents cited "difficult to access calendar(s) from other locations" (Table 3, #2) as a scheduling challenge. Several people using their work Outlook calendar as their primary personal calendar who did not have mobile devices commented that this problem typically occurred on weekends. For paper calendars users the issue seemed to occur when the respondent was at work or outside the home and could not view their paper wall calendar.

5.2 A Single Place
Initially we were surprised that so many of our respondents were using their work digital calendar as the primary place to put personal and household appointments. However, as we saw from numerous comments people found a single place necessary to manage their lives and avoid double booking or forgetting to do things. Respondents using the work Outlook calendars also selected "Easy to synchronize with work calendars" as their most popular reasons for using the calendar at work for personal scheduling.

We also saw some people citing the lack of a single place as a challenge with 34% of respondents reporting they had too many calendars to duplicate information across and 33% having too many calendars to maintain. Survey comments highlighted challenges faced by the inability to have all household calendar information in one place. For example, "The challenge is one calendar is electronic, one is on paper... how does one consolidate."

While people found locating all calendar information in a single place to be important, it is critical to realize that many of these same respondents also described how they would like to be able to selectively view either personal or work events as a way to allow separation between personal and work items in certain situations. For instance, on the weekends being able to turn off work information and focus on personal events. So while people recognize that having a single place makes sense logistically to avoid schedule mishaps, they still want to be able to maintain control over the type of information they focus on at any one time.

5.3 Coordinating With Others
Not surprisingly, the need to coordinate with others (typically partners) was seen repeatedly in survey comments. Similar to Taylor and Swan's discussion of the importance of flexible systems that can be adapted to suit the needs of households [18], we saw that respondents achieved scheduling coordination in a

variety of different ways. Some respondents described using one person's work calendar as the main calendar and sending meeting invitations to keep the calendar current. Others with partners at Microsoft could share their work calendar. As one commented: "If either one of us did not work at Microsoft, it would be nearly impossible to share our calendars." The paper calendar users told us they were typically sharing their calendars with at least one other person and one of the major advantages cited for paper calendars was that they were accessible to everyone in a central location, typically at home on the wall.

6. Implications for Digital Calendar Design

The results of our survey suggest several ways that digital calendars could be improved to better meet the needs of families. Of course we primarily received feedback from those using Outlook as a digital calendar and those using paper calendars, but we have tried to generalize the feedback to be applicable to digital calendars more broadly.

6.1 Single View, Different Sources

While the theme of having calendar information in a single place was expressed by users of digital and paper calendars. We also saw some people, particularly those using the work digital calendar, recognizing there was a trade-off between privacy of their personal appointments and convenience. As one respondent commented "the benefits [of using work calendar] far outweigh the privacy implications of having personal items listed in our work calendars."

One respondent's comment perhaps best expresses the desire to have a single place to view information without being required to store the information all together. The respondent wrote: "I wish I could have exactly the same experience I get by keeping my personal stuff on my work outlook/exchange calendar, but have it stored someplace besides at work." Going forward digital calendaring applications should be aware that users desire the ability to have a single view of information stored in multiple locations (e.g. home calendar and work calendar).

Of course along with providing a single view of different sources, perhaps work information and more personal events, the application will need to support the desire was saw to sometimes have separation between work and home information. For example, perhaps during core work hours the calendar might not show evening personal appointments by default. Or the digital calendar at home might default to only show work events outside of core work hours.

6.2 Improve Privacy Options

In addition to concerns about putting personal information on servers owned by Microsoft, another set of privacy concerns centered around the fact that other colleagues might see a person's private events. For example, one respondent described a breakdown where they had their laptop on an overhead projector and personal reminders came up. Another respondent requested: "Also would like to have privacy option so when you show your calendar with other folks personal items do not appear - not just marking private but as a view on your screen." These comments both indicate a desire to have more control over how and when personal events are displayed.

While it is possible to mark personal events as private and many respondents told us they did that, it can be a lot of work if one has all personal events on their calendar. Digital calendar applications seeking to accommodate both work and personal items, might assist users by making events scheduled during defined non-work hours private by default or recognize that events that invite only a person's partner are typically made private and provide an option to make those events private by default.

6.3 Better Support for Coordination

Any digital calendar for families to share or for single maintainers needs to recognize the critical role of coordinating and scheduling among family members. Although several people expressed that meeting invites helped them schedule there were also a considerable number of respondents who mentioned how difficult it is to share calendar information with their partner.

Since most couples may not work at the same company, calendars, particularly those aimed at the work place like Microsoft Outlook, need to provide better support for publishing information to trusted individuals. For example, one might want to publish free/busy information during the work day to their partner at another company without sharing details of calendar events.

6.4 Enhance Event options

In the survey comments, respondents suggested a number of ways that calendar event options could be improved.

- Multiple Reminders: Reminders were one of the most popular things about digital calendars. Several respondents described the value of allowing multiple reminders for a single event. For example, a first reminder for purchasing a birthday present and the second reminder for the party.

- Travel Time: Respondents also wanted events in digital calendars to recognize the need to specify the actual time of the event and the amount of time needed to commute to the event. Some respondents currently set separate appointments for travel time to address this issue.

- Time zones: Numerous respondents commented on problems scheduling appointments in different time zones, for example when they went on vacation or had to schedule meetings with colleagues in a different time zone. Digital calendars may wish to allow users more control over the time zone of a particular event, perhaps even allowing sections of the calendar to live in different time zones.

6.5 Incorporate Advantages of Paper

Several themes including the attractiveness of art and pictures on paper calendars, the ability to save calendars for future reference, and the ability to personalize by theme or color emerged from the comments of those using paper calendars. One respondent commented on how his or her household creates paper calendars that incorporate family photos, suggesting the value digital family calendars might gain by making it easy to display family photos in the calendar.

Digital family calendars could also recognize the value of offering support for archiving by providing ways for families to print their digital calendars at the end of each year, perhaps including favorite photos from the year. Finally, digital family calendars should recognize the central role that calendars play in family's lives and allow them to be personalized with different themes.

7. CONCLUDING REMARKS

Our survey of six hundred and twenty-one people at a technology company provides an interesting picture of how a particular group of people manage their personal and household calendars. The

fact that over 50% of our respondents were using their work provided digital calendar as their primary personal calendar was surprising and very different compared to previous research.

The contributions of our research include a description of key themes related to personal and household scheduling such as the importance of a single place for calendar data, the need for constant access and desire to coordinate with others. The survey data also suggests a variety of ways that current digital calendars could be improved to better meet personal and household scheduling needs, including providing a single view of data from multiple sources, enhancing privacy options, and adding features for calendar events.

8. ACKNOWLEDGMENTS

9. REFERENCES

[1] AirSet, http://www.airset.com/Top/WhatIs/WhatIsAirset.jsp

[2] Beech, S., Geelhoed, E., Murphy, R., Parker, J., Sellen, A., and Shaw, K., *The Lifestyles of Working Parents: Implications and Opportunities for New Technologies.* Technical Report HPL-2003-88(R.1), HP Laboratories Bristol, 2004.

[3] Crabtree, A., Hemmings, T. and Mariani, J., Informing the design of calendar systems for domestic use. In *Proceedings of ECSCW 2003*, (Helsinki, Finland, Sept. 14th-18th, 2003), Kluwer Academic Publishers, 119-138.

[4] Crabtree, A., and Rodden, T., Domestic Routines and Design for the Home, *Computer Supported Cooperative Work*, **13**: 191-220, 2004.

[5] Darrah, C., English-Lueck, J., and Freeman, J., *Families and Work: An Ethnography of Dual Career Families*, Report to Alfred P. Sloan Foundation (Grant Number 98-6-21), http://www2.sjsu.edu/depts/anthropology/svcp/SVCPslnr.html

[6] Equator Project, http://www.equator.ac.uk/index.php

[7] FamilyScheduler, http://www.netsimplicity.com/products/family/

[8] Hutchinson, H., Bederson, B., Plaisant, C., and Druin, A., *Family Calendar Survey*, Technical Report HCIL-2002-21, University of Maryland, MD, 2002.

[9] ical, http://www.apple.com/ical/

[10] interLiving Project, http://interliving.kth.se/

[11] Nippert-Eng, C., *Home and Work: Negotiating Boundaries Through Everyday Life*. University of Chicago Press, Chicago, IL, 1996.

[12] OurFamilyWizard, https://www.ourfamilywizard.com/index.cfm

[13] Palen, L., Calendars on the New Frontier: Challenges of Groupware Technology. Ph.D. Thesis, University of California, Irvine, 1998.

[14] Plaisant, C., Bederson, B., Clamage, A., Hutchinson, H., and Guimbretière, F., *Shared Family Calendars: Promoting Symmetry and Accessibility*, Technical Report HCIL-2003-38, University of Maryland, MD, 2003.

[15] Sellen, A., Hyams, J., Eardley, R., *The Everyday Problems of Working Parents: Implications for New Technologies*, Technical Report HPL-2004-37, HP Laboratories Bristol, 2004.

[16] ScheduleUs Family, http://www.scheduleus.com/family.html

[17] Taylor, A., and Swan, L., List making in the home. In *Proceedings of CSCW 2004*, (Chicago, IL, Nov 6-10, 2004), ACM Press, 542-545.

[18] Taylor A., and Swan, L., Artful systems in the home. In *Proceedings of CHI 2005*, (Portland, OR, April 2-7, 2005), ACM Press, 641-650.

[19] Trumba, http://www.trumba.com/

[20] Tullio, J. Goecks, J., Mynatt, E. and Nguyen, D., Augmenting Shared Personal Calendars, In *Proceedings of UIST 2002,* (Paris, France, Oct. 27-30, 2002), 11-20.

10. Appendix: Survey Results

Survey Instructions:

Our goal is to learn how people at Microsoft and members of their households manage scheduling and coordination for personal events. The results of this survey will be used to inform future design and development of digital calendars. In this survey we define household to mean any children and adults you live with. For example, a spouse, partner, roommates, kids, parents or au pair. If you are uncomfortable answering non-required questions such as gender please skip them. This survey is anonymous.

Demographics

How many people live in your household including yourself? If you share custody of any children, please include them.

Option	Count	%
1	56	9
2	143	23
3	186	30
4	160	25.8
5	52	8.4
6 or more	24	3.9
Total	**621**	**100%**

1. How many people in your household fall in these age categories (including yourself)?

Option	1	2	3	4+
Toddler(s) age 0-2	186	18	1	0
Kid(s) age 3-8	160	53	4	1
Youth(s) age 9-11	63	14	2	0
Adolescent(s) age 12-17	60	16	4	1
Adult(s) age 18-30	76	74	5	2
Adult(s) age 31-45	125	324	6	1
Adult(s) age 46-60	38	37	1	0
Adult(s) age over 60	13	12	1	0

2. What country/region do you live in?

Option	Count	%
Australia	2	0.3%
Brazil	1	0.2%
Canada	3	0.5%
Chile	1	0.2%
China	3	0.5%
Czech Republic	2	0.3%
Denmark	4	0.6%
Egypt	1	0.2%
France	4	0.6%
Germany	2	0.3%
India	11	1.8%
Ireland	6	1%
Israel	1	0.2%
Italy	1	0.2%
Japan	4	0.6%
Korea	1	0.2%
Latvia	1	0.2%
Netherlands	3	0.5%
New Zealand	1	0.2%
Poland	1	0.2%
Puerto Rico	1	0.2%
Singapore	2	0.3%
Spain	4	0.6%
Sweden	1	0.2%
Switzerland	2	0.3%
Turkey	1	0.2%
United Kingdom	6	1%
United States	548	88.7%
Total	**618**	**100.3%**

3. If applicable, in what US state do you reside?

Option	Count	%
Alaska	1	0.2%
California	10	1.8%
Colorado	2	0.4%
Illinois	2	0.4%
Massachusetts	4	0.7%
Minnesota	1	0.2%
Missouri	1	0.2%
New Jersey	2	0.4%
New York	2	0.4%
North Carolina	4	0.7%
North Dakota	10	1.8%
Oregon	1	0.2%
Pennsylvania	1	0.2%
Rhode Island	1	0.2%
South Carolina	5	0.9%
Texas	9	1.6%
Virginia	1	0.2%
Washington	491	89.4%
Wyoming	1	0.2%
Total	**549**	**99.9%**

4. Do you have a car for each member of your household that can drive?

Option	Count	%
Yes	496	80.8%
No	118	19.2%
Total	**614**	**100.%**

5. How many hours per week do you work at Microsoft?

Option	Count	%
40+ Hours	592	95.3%
30-39 Hours	23	3.7%
20-29 Hours	5	0.8%
Fewer than 20	1	0.2%
Total	**621**	**100%**

6. What is your gender?

Option	Count	%
Male	332	53.7%
Female	279	45.1%
Prefer not to specify	7	1.1%
Total	**618**	**99.9%**

7. What is your family status?

Option	Count	%
Single	105	16.9%
Couple (married, domestic partner, etc)	507	81.6%
Prefer not to specify	9	1.4%
Total	**621**	**99.9%**

8. What is your spouse or partner's gender? (asked if applicable)

Option	Count	%
Male	214	45.8%
Female	251	53.7%
Prefer not to specify	2	0.4%
Total	**467**	**99.9%**

9. Does your spouse or partner work outside the home? (asked if applicable)

Option	Count	%
No	148	31.1%
Yes, 40+ hours per week	244	51.3%
Yes, 30-39 hours per week	34	7.1%
Yes, 20-29 hours per week	17	3.6%
Yes, Fewer than 20 hours	33	6.9%
Total	**476**	**100.0%**

10. Does your spouse or partner work at Microsoft? (asked if applicable)

Option	Count	%
Not applicable	36	7.5%
Yes	103	21.5%
No	340	71.0%
Total	**479**	**100.0%**

11. If additional adults besides your partner reside in your household, do they work outside the home? Please indicate no or yes and number of hours for each additional adult

No responses

Scheduling Solutions

In this section we will ask you about the calendar(s) you and your household (if applicable) use for scheduling personal events. We use the term "calendar" to refer to any method you use to do this including wall calendars, digital calendars, Post-It notes or the back of your hand.

12. How many calendars do you use at least once per week (either adding events or viewing the calendar)? Please include your MS Outlook calendar, any family calendars, other personal calendars, and calendars from other groups such as soccer or school.

Option	Count	%
0	1	0.2%
1	106	17.1%
2	180	29.1%
3	181	29.2%
4	90	14.5%
5+	61	9.9%
Total	**619**	**100.0%**

13. Of these calendars how many are digital calendars (you access them on a digital device, e.g. pc, or PDA)?

Option	Count	%
0	31	5.0%
1	317	51.2%
2	193	31.2%
3	58	9.4%
4	11	1.8%
5+	9	1.5%
Total	**619**	**100.1%**

14. Which of the following do you and members of your household (if applicable) use to record personal (non-work related) calendar information? (Check all that apply)

Option	Count	%
Wall Calendar (e.g. hanging monthly calendar, whiteboard)	389	23.7%
Desk Calendar (e.g. paper blotter, paper cube)	80	4.9%
Pocket Calendar (e.g. paper day planner, paper diary)	106	6.5%
PC-based Calendar (e.g. Microsoft Outlook)	468	28.5%
PDA (e.g. PocketPC, Palm Pilot)	151	9.2%
Cell phone (includes Smartphones)	171	10.4%
Notes (e.g. Post-It notes, scraps of paper)	228	13.9%
Other (Please specify below)	42	2.6%
None	9	0.6%
Total	**1644**	**100%**

15. If you selected Other in the previous question please explain.

45 responses

16. On average how much time per week do you spend on scheduling personal events for yourself and your household?

Option	Count	%
Less than 30 minutes	289	46.8%
Between 30 minutes and 1 hour	232	37.5%
Between 1 and 2 hours	76	12.3%
More than 2 hours	21	3.4%
Total	**618**	**100.%**

17. From which of the following calendars do you include events on your personal or household calendar? (Check all that apply)

Option	Count	%
School calendar (e.g. school, daycare)	313	18.5%
Team calendar (e.g. sports, debate)	214	12.6%
Social group calendar (e.g. church, book club)	342	20.2%
Newspaper (e.g. community event listings)	98	5.8%
Public online calendars (e.g. community, professional sports team or entertainment calendars)	133	7.9%
Holidays (e.g. national, religious)	436	25.7%
Other (please specify below)	94	5.5%
None	64	3.8%
Total	**1694**	**100%**

18. If you selected Other in the previous question please explain.

94 responses

We now have a few questions about the Microsoft Outlook Calendar you use at work. In particular, how many personal events you include on this calendar.

19. What is the most common calendar view you use?

Option	Count	%
Day	311	50.2%
Work Week	178	28.7%
Week	80	12.9%
Month	48	7.7%
Other	3	0.5%
Total	**620**	**100%**

20. How much personal scheduling information do you include on your work Outlook calendar?

Option	Count	%
None	33	5.3%
Some personal and household events	336	54.3%
All personal and household events during business hours	59	9.5%
All personal and household events	191	30.9%
Total	**619**	**100%**

21. Which of the following types of personal events do you include on this calendar? (Check all that apply)

Option	Count	%
Personal/Household appointments (e.g. doctor)	568	21.1%
Personal/Household social events (e.g. Theater)	396	14.7%
Family/Friends vacation days	335	12.5%
Birthdays	364	13.5%
Personal reminders	472	17.5%
Personal tasks	334	12.4%
Other personal events	198	7.4%
None	24	0.9%
Total	**2691**	**100%**

22. How many work colleagues do you allow to view details about your calendar events (additional information besides free/busy)?

Option	Count	%
None	365	58.8%
A few people	149	24.0%
Most people	40	6.4%
Everyone at MS	67	10.8%
Total	**621**	**100%**

Now think about the calendar where most of your personal and/or household events (dinner with friends, kids events, etc) are recorded. Please tell us more about that calendar.

23. Is the calendar where most of your personal and/or household events are recorded

Option	Count	%
Paper	233	37.5%
Your MS Outlook calendar	317	51.0%
Another digital calendar (MSN, etc.)	51	8.2%

I do not record personal items on a calendar	20	3.2%
Total	**621**	**99.9%**

[Survey Note: Different questions were included based on the answer to 23. When questions overlap we present aggregate data and thus the question may have appeared in slightly different order on the survey]

24. Who in your household adds events to the calendar? (all branches)

Option	N/A	Never Add	Occasionally Add	Often Add	Mainly Add
You	7	13	81	43	216
Your partner/ Other household member	18	110	72	61	82
Other household member	73	233	54	9	5

MS Outlook Survey Branch: Respondents answered Questions 25 - 27 if they selected "Your MS Outlook Calendar" in response to Question 23.

25. Why do you use a digital calendar for scheduling personal events?

Option	Count	%
Easy for different people to view and edit	84	13.1%
Accessible from multiple locations	227	35.4%
Easy to synchronize with work calendar	240	37.4%
Other (Please specify below)	78	12.1%
None	13	2.0%
Total	**642**	**100%**

26. If you selected Other in the previous question please explain.

   82 responses

27. Please briefly describe how you use this calendar and any challenges or successes you experience.

   145 responses

Paper & Other Calendar Survey Branch: Respondents answered Questions 28 - 30 if they selected "Paper" or "Other" in response to Question 23.

28. How many people including yourself share this calendar (either viewing or adding appointments)?

Option	Count	%
1 (Just yourself)	66	24.4%
2	133	49.1%
3	31	11.4%
4+	41	15.1%
Total	**271**	**100%**

29. Which of the following types of personal events do you record on this calendar?

Option	Count	%
Personal/Household appointments (e.g. doctor)	253	17.8%
Personal/Household social events (e.g. Theater)	237	16.7%
Family/Friends vacation days	213	15.0%
Birthdays	231	16.3%
Personal reminders	217	15.3%
Personal tasks	168	11.8%
Other personal items	101	7.1%
None	1	0.1%
Total	**1421**	**100%**

30. How many work related events do you include on this calendar?

Option	Count	%
None	100	37%
Some work related events	128	47.4%
All work related events during non-business hours	26	9.6%
All work related events	16	5.9%
Total	**270**	**100%**

Paper Calendar Only Branch: Respondents only answered Questions 31 - 35 if they selected "Paper" in response to Question 23.

31. Where is the calendar primarily located?

Option	Count	%
Home kitchen	156	67.0%
Home office	26	11.2%
Home other room	15	6.4%
Purse/Pocket	25	10.7%
Wallet	2	0.9%
Office	5	2.1%
Other Location	4	1.7%

| **Total** | **233** | **100%** |

32. What type of calendar is it?

Option	Count	%
Wall	166	71.6%
Desk	25	10.8%
Pocket	36	15.5%
Other	5	2.2%
Total	**232**	**100.1%**

33. What is the primary layout of your paper calendar?

Option	Count	%
Day	11	4.7%
Work Week	2	0.9%
Week	33	14.2%
Month	183	78.5%
Year	3	1.3%
Other	1	0.4%
Total	**233**	**100%**

34. Why do you use a paper calendar for scheduling personal events? (mark all that apply)

Option	Count	%
Easy to use	204	25.8%
Accessible in a central location (e.g. kitchen)	184	23.3%
Portable (e.g. take to events/appointments)	57	7.2%
Always available (e.g. no need to turn on)	193	24.4%
Can be personalized (e.g. different colors for different kids, symbols for events)	52	6.6%
Can be saved as a reminder of what we did (e.g. memories)	66	8.3%
Other	34	4.3%
None	1	0.1%
Total	**791**	**100%**

35. Please briefly describe how you use this calendar and any challenges or successes you experience. (If the calendar is of a particular brand: e.g. Mom's Plan-It, or Dayrunner please share that information)

141 responses

Other Digital Calendar Branch: Respondents answered Questions 36 - 41 if they selected "Another digital calendar (MSN, etc)" in response to Question 23.

36. What type of digital calendar do you use?

Option	Count	%
Outlook (not hosted through Microsoft)	15	29.4%
MSN	7	13.7%
Microsoft Works	0	0.0%
Pocket PC/Palm Pilot	15	29.4%
Cell phone	6	11.8%
Other (Please specify below)	8	15.7%
Total	**51**	**100%**

37. If you selected Other in the previous question please explain.

   8 responses

38. What is the most common view you use?

Option	Count	%
Day	17	33.3%
Work Week	5	9.8%
Week	14	27.5%
Month	14	27.5%
Other	1	2.0%
Total	**51**	**100.1%**

39. Why do you use a digital calendar for scheduling personal events? (Check all that apply)

Option	Count	%
Easy for different people to view and edit	25	26.6%
Accessible from multiple locations	32	34.0%
Easy to synchronize with work calendar	17	18.1%
Other (Please specify below)	19	20.2%
None	1	1.1%
Total	**94**	**100%**

40. If you selected Other in the previous question please explain.

   20 comments

41. Please briefly describe how you use this calendar and any challenges or successes you experience.

38 comments

Scheduling Challenges

In this section we are interested in understanding what challenges, if any, you experience related to scheduling and coordination for yourself and your household.

42. How satisfied are you with the current methods you and members of your household use to schedule personal events?

Option	Count	%
Very Satisfied	130	21.0%
Somewhat Satisfied	338	54.7%
Somewhat Dissatisfied	127	20.6%
Very Dissatisfied	23	3.7%
Total	**618**	**100.0%**

43. What challenges, if any, do you have in scheduling for yourself and your household? (Check all that apply)

Option	Count	%
Too many calendars to maintain	202	33.7%
Too many calendars to duplicate information across	213	35.6%
Forget to write things on a calendar	382	63.8%
Hard to keep track of the schedules of other members of my household	267	44.6%
Difficult to access calendar(s) from other locations (e.g. calendar in kitchen from work)	312	52.1%
Difficult to move or change events once they are placed on the calendar	134	22.4%
Complicated to schedule work events that occur during non-work hours	77	12.9%
Complicated to schedule non-work events during work hours	105	17.5%
Hard to deal with uncertain events (e.g. things we might attend)	184	30.7%
Flexible work schedules (e.g. different schedules each week for partner)	73	12.2%
Other (Please specify below)	79	13.2%

44. If you selected Other in the previous question, please explain.

   82 comments

45. Please rate the degree to which you experience the challenges described in the following statements:

Option	Never	Rarely	Occasionally	Often	Always
Scheduling personal events for me and members of my household takes more effort than I would like	72	186	215	110	29
I have to coordinate multiple calendars when members of my household are invited to events	126	141	165	123	55
I forget to add events to the appropriate calendar(s)	49	147	270	121	23
Coordinating my schedule with other members of my household takes a lot of work	98	174	182	119	35
Scheduling personal and household events causes me stress	142	214	161	67	23
Scheduling events with people outside my household takes more effort than I think it should	78	136	223	126	44

46. What are methods you use for handling uncertain calendar information, e.g. events you may or may not attend, things that need to happen "after work" or "sometime next week"?

Option	Count	%
To do lists/notes/Post-It notes	329	53.8%
Make item visually distinct on your calendar using notation or color, or label	213	34.8%
Guess a day/time and move as necessary	251	41%
Don't record it	126	20.6%
Record it somewhere else on the calendar (e.g. margin, or evening)	111	18.1%
Other (Please specify below)	67	10.9%

47. If you selected Other in the previous question, please explain

70 comments

Negotiation

We are interested in how you negotiate scheduling with your spouse or partner and, if applicable, other members of your household

48. What are common ways that you and other members of your household (e.g your partner, children, etc) use to discuss scheduling (e.g. whether you will attend certain events)?

Option	Count	%
Face-to-face conversation	518	92.5% (of 621 possible)
Email	397	70.9%
Phone	444	79.3%
IM	200	35.7%
Typically don't discuss	7	1.3%
Other	17	3%
N/A	3	0.5%

49. What is the primary method you and other members of your household (e.g your partner, children, etc) use to discuss scheduling (e.g. whether you will attend certain events)?

Option	Count	%
Face-to-face conversation	332	59.3%
Email	89	15.9%
Phone	106	18.9%
IM	27	4.8%
Typically don't discuss	2	0.4%
Other	1	0.2%
N/A	3	0.5%
Total	**560**	**100%**

50. Roughly how often do you experience a scheduling "mishap" in your household? For example, you and your partner schedule things at the same time or an event is left off the calendar or there is confusion over who will pick up kids?

Option	Count	%
Never	36	6.4%
Rarely	287	51.2%
About once a month	173	30.9%
About once a week	54	9.6%
Several times a week	5	0.9%
Daily	0	0.0%
N/A	5	0.9%
Total	**560**	**99.9%**

Technology Usage

This section asks about the technology you use at home and on the go.

51. How many hours per week (on average) do the members of your household use computers, including both work and personal use?

Option	N/A	1	1-10	11-20	21-30	31-40	40+
You	0	2	7	8	15	67	506
Your partner/Other household member	9	9	84	84	71	49	245
Other household member	111	44	111	49	23	10	11
Other household member	73	25	57	24	8	3	7
Other household member	25	6	21	8	4	0	1
Other household member	7	2	7	2	1	0	1
Total	**225**	**88**	**287**	**175**	**122**	**129**	**771**

52. How many personal computers do you have in your home? (Please include any work related laptops that you often use at home.)

Option	Count	%
0	6	1.0%
1	97	15.8%
2	169	27.5%
3	154	25.0%
4	84	13.7%
5+	105	17.1%
Total	**615**	**100.1%**

53. How many of your computers are located in each of these places at home?

	0	1	2	3	4	5+
Home Office	42	260	123	31	16	6
Kitchen	151	58	3	0	0	0
Living room	156	74	11	3	0	0
Family room	129	81	15	2	0	0
Dining room	154	14	2	1	0	0
Bedroom	117	92	26	5	1	1
Garage	146	11	2	1	1	0
Attic	152	4	3	0	0	0
Closet	142	12	3	0	1	2
Mobile laptop	46	212	120	29	9	1
Other	111	32	8	2	1	0

54. What is the speed of the primary Internet/modem connection you use at home?

Option	Count	%
No connection	11	1.8%
33.6K (or slower) dial-up modem connecting over a regular phone line	4	0.7%
56K (or faster) dial-up modem connecting over a regular phone line	15	2.4%
Dial-up modem (unsure of speed) connecting over a regular phone line	12	2.0%
ISDN line	2	0.3%
Cable modem (your cable TV company provides your Internet service)	301	48.9%
DSL or ADSL modem (high speed phone line)	254	41.3%
T-1 or T-3 Line	6	1.0%
Satellite connection	2	0.3%
Some other way	6	1.0%
Don't know	2	0.3%
Total	**615**	**100%**

55. Do you have wireless access in your home (e.g. your own network, shared neighborhood network)?

Option	Count	%
Yes	486	78.8%
No	123	19.9%
Don't know	8	1.3%
Total	**617**	**100%**

56. What types and how many mobile device(s) do you and other members of your household (if applicable) own? We consider Smartphones to be cell phones.

	0	1	2	3	4	5+
Cell phone with activated internet access	224	181	66	18	3	2
Cell phone without internet access (or unactivated)	96	187	197	28	11	4
PocketPC or other PDA with internet access	288	97	14	2	2	0
PocketPC or other PDA without internet access	235	134	25	2	0	0
Other	184	14	2	0	0	1