

# Comparing Web Applications with Desktop Applications: An Empirical Study

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# Motivation and Objective



- **Drawbacks of desktop applications:**
  - development done on multiple platforms,
  - have to download before their use,
  - administration and maintenance.
- **Web applications:**
  - thousands implemented in recent years,
  - used by millions of users.
- **Usability of web applications compared with desktop applications.**

- **Desktop application:**  
WIMP,  
direct manipulation.

- **Web application:**  
runs on a server and presents itself through a web browser.

Examples: web based email, bookmark managers, personal information managers, web calendars, online banking.

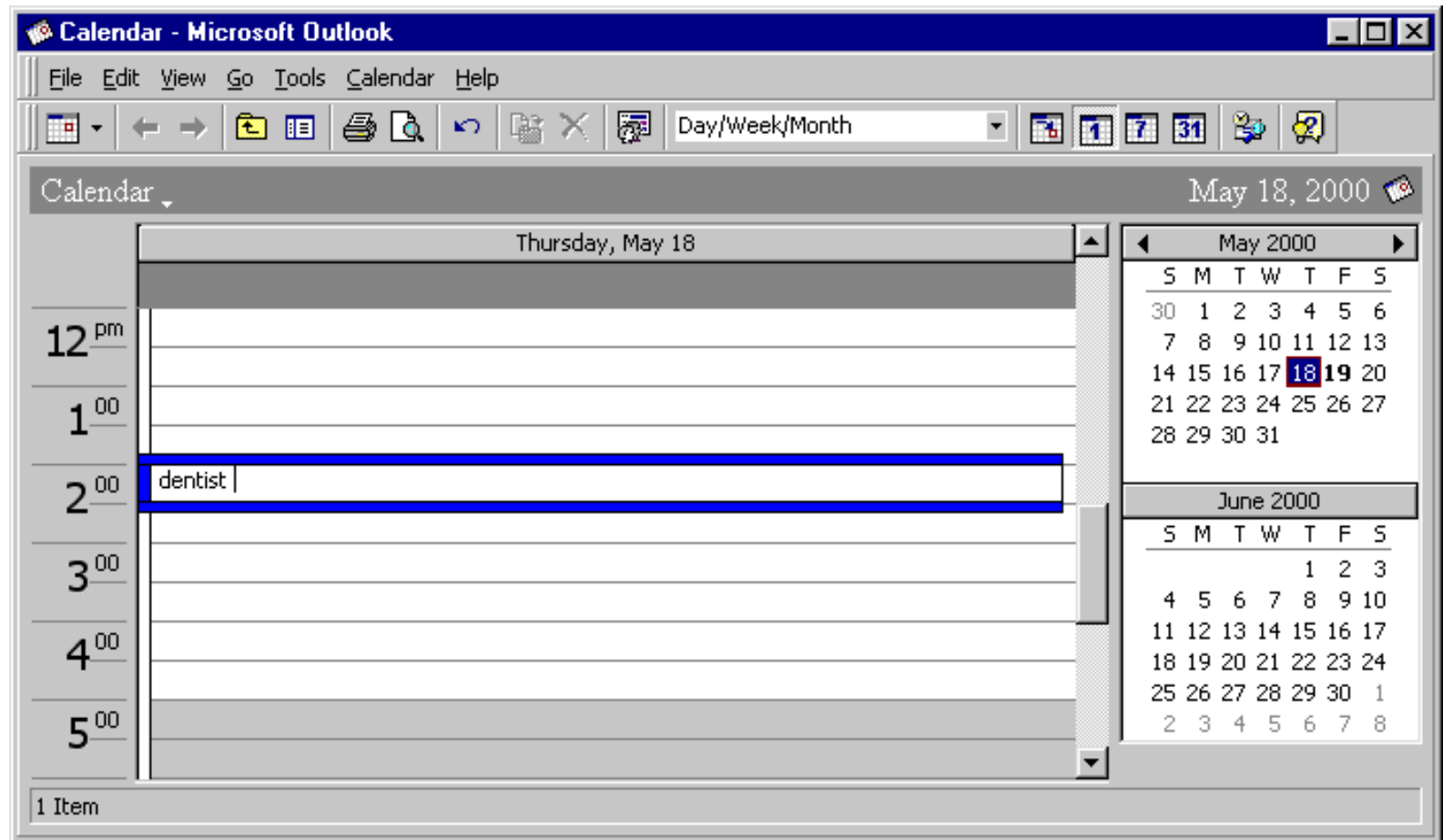


# Calendar Application



- Our **specifications** for an application: cost and size.
- **Calendar applications:**
  - overview of a day, week, year;
  - add, delete and move events;
  - find free slots and events;
  - reminders, meeting planners, sharing, “to do” lists.

# Microsoft Calendar



# Yahoo!Calendar

The screenshot shows the Yahoo! Calendar interface in a Netscape browser window. The browser's address bar displays the URL: `http://calendar.yahoo.com/jc/YYY:47271/srt:0?v=0&t=958694400`. The page features a navigation bar with links like "Welcome paupo", "Yahoo! - My Yahoo!", "Options - Sign Out - Help", and "Mail", "Addresses", "Calendar", "Notepad". A large green banner for "YAHOO! Auktioner" with the text "Klicka här!" is prominent. Below this, a calendar grid shows the month of May 2000, with the 19th highlighted as "Friday May 19, 2000". A "Quick Add" section on the left allows for adding new events with fields for "Event Title", "Date & Time", and "Add". A "To Do" section at the bottom shows "No tasks listed". The main calendar area displays a list of events for the selected date, including a "dentist" appointment from 2:30 pm to 3:30 pm, marked as "BUSY".

The "New Event" form is displayed, showing fields for "Title" (80 characters max.), "Type" (Appointment), "Date and Time" (May 19, 2000), "Sharing" (Private, Show as Busy, Public), and "Notes" (120 characters max.). The "Date and Time" section includes a "Find Free Times" link and a "Duration" field set to 1 hour and 00 minutes. The "Repeating" section indicates "This event does not repeat." The "Reminders" section states "There are no reminders for this event." The "Invitations" section states "There are no invitations for this event." The form includes "Save", "Save and Add Another", and "Cancel" buttons.

# Study Setup: Tasks

- Training tasks.

- Tasks:

<b>Go To</b>	From today, go to July 17.
<b>Add</b>	Add “Buy tickets” from 2pm, for 30 min.
<b>Move</b>	Move two consecutive events 1 hour.
<b>Undo</b>	Undo the previous move task.

- Time per task in seconds, errors.
- Small pilot study.
- Record and Playback: ScreenCorder.



# Study Setup, Continued

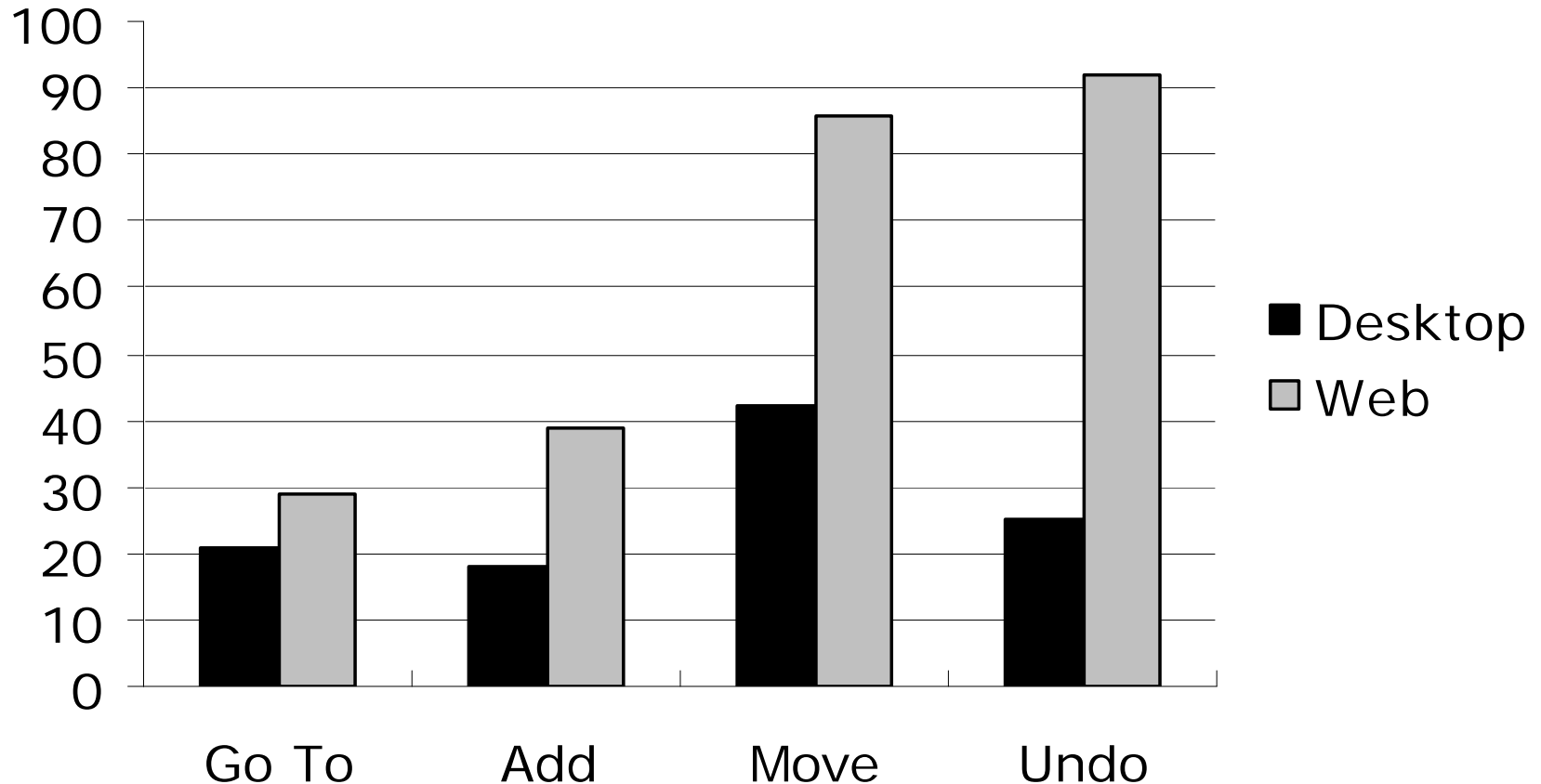


- Six subjects: five male and one female.
- On average 48 minutes with the study.
- Allowed to abort tasks.
- Questionnaire:
  - age from 25 to 27 years, median of 26.3 years,
  - more than 5 years experience with computers,
  - used computers more than 20 hours per week,
  - three used the web applications,
  - one used calendaring applications before.
- **Limitations: subjects, statistical analysis.**






# Average Time per Task



# Error Rates

	Go To		Add		Move		Undo	
	MC	YC	MC	YC	MC	YC	MC	YC
OK	6	6	6	6	5	5	6	3
Error	0	0	0	0	1	1	0	2
Abort	0	0	0	0	0	0	0	1

# Usability Problems

Start time: Fri 5/19/00 2:30 PM ☐ All day event  
End time: Fri 5/19/00 2:30 PM  
☐ Reminder: 15 minutes  : Out of Office  
3:00 PM  
3:30 PM  
4:00 PM  
4:30 PM

**Appointment Recurrence** ? X

Appointment time  
Start: 12:00 AM End: 12:00 AM Duration: 1 day  
Recurrence pattern

Appointment time  
Start: 12:00 AM End: 1:00 AM Duration: 25 hours

Appointment time  
Start: 12:00 AM End: 1:00 AM Duration: 1 hour  
Recurrence pattern  
☐ Daily Recur every 1 week(s) on:  
☒ Weekly ☐ Sunday ☐ Monday ☐ Tuesday  
1 hour  
2 hours  
3 hours  
4 hours  
5 hours

Duration: 1 hours :00  
minutes

- **Hypothesis** (confirmed):

the performance of users will be significantly reduced.

- **3 factors:**

limited interaction mechanisms provided by web browsers,  
mismatch: user's mental model and the application,  
delays from downloading the web pages.



# Conclusions and Future Work



- Users are **twice as slow** when using web applications: interaction mechanisms provided by the web browsers, lack of delimitation between browsers and web applications.
- Future work:
  - predicting** the performance degradation,
  - guidelines** for web applications,
  - mapping** existing desktop applications to web.

