

DIGITAL WORK ENVIRONMENTS

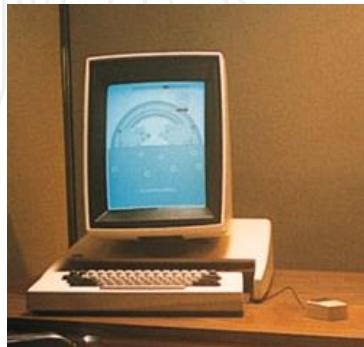
History and What's Next after
Siri and Cortana



DIGITAL WORK ENVIRONMENTS

ORIGINS



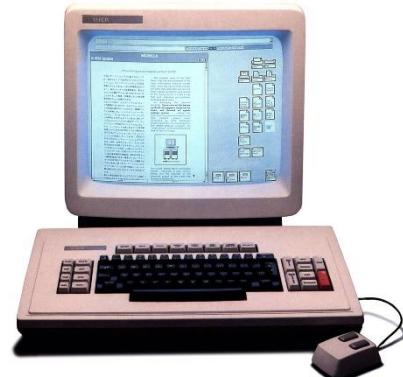


Alto
(1972)



Macintosh
(1984)

Star
(1981)



Windows
95 (1995)



DESK. METAPHOR MENTAL MODEL

- **Display documents** in overlapping windows
- **Access documents** in hierarchical file system
- **Folders = workspaces**

Simple, no-nonsense, coherent =
SUCCESS!

DESK. METAPHOR EVOLUTION

- 1972, 1991, 1995: Multitasking (Alto, Apple System 7, Windows 95) – work on several apps at once
- 1986: Multiple Desktops (Rooms) – task-related workspaces
- 1995: Taskbar (Windows 95) – switch between open windows
- 2004: Groups in Taskbar (GroupBar) – grouping tasks by apps
- 2004: Spotlight (Mac OS X) – integrated search across apps and files
- 2012: Integration of people, email, contacts, social networks into Shell (Windows 8)

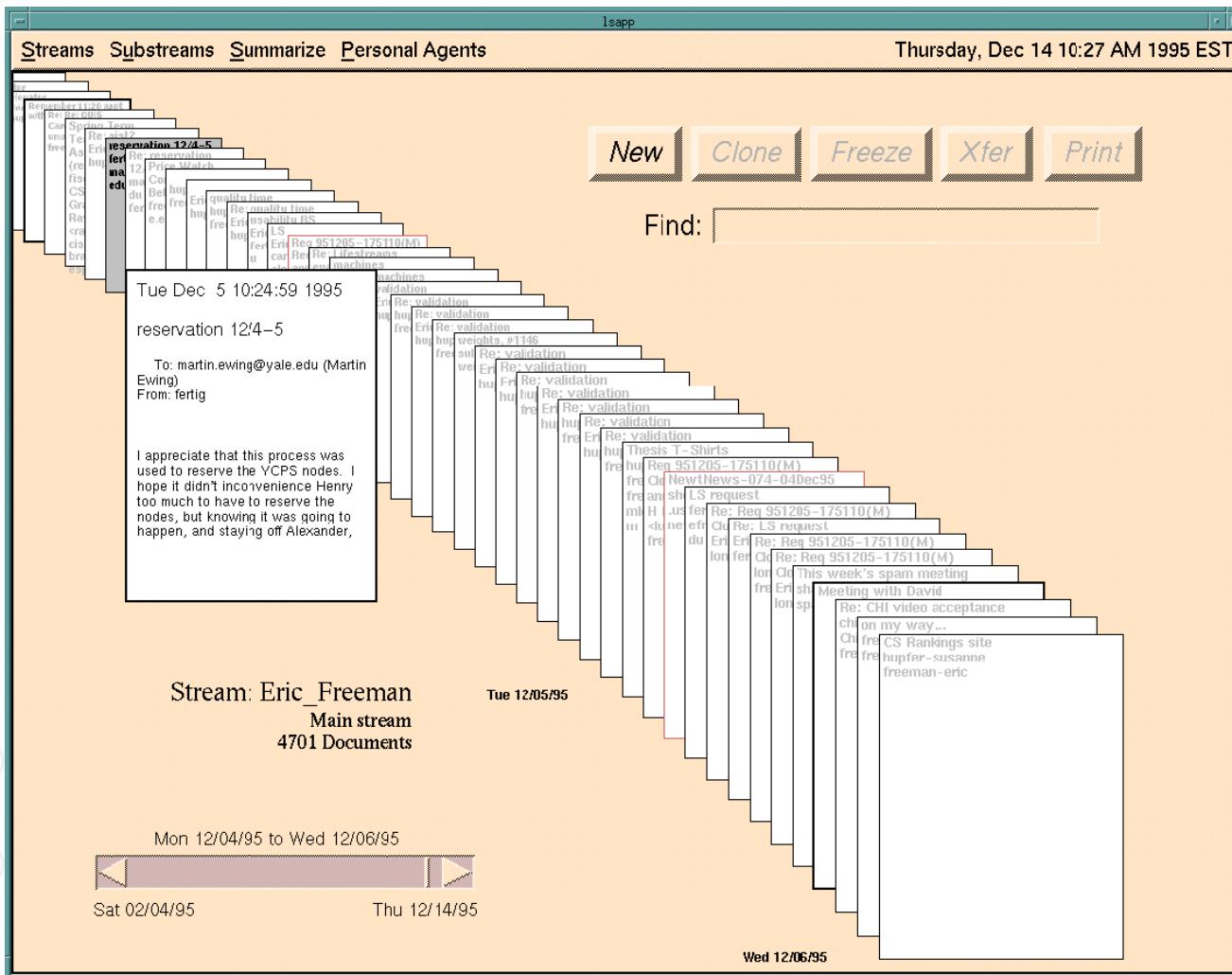
PROBLEMS

- In desk. Metaphor, both Access (file system) and Display (seeing contents) is done on the same small screen → switching
- Apps introduce own virtual hierarchies (e.g., email) → not files
- Browsers give access to public/private networks (web) → not files
- Hierarchical info organization is hard to support over time, doesn't preserve links



DESKTOP METAPHOR ALTERNATIVES

Time stream - Lifestreams, 1994



RDF desktop – Haystack, 1999

The screenshot displays the Haystack RDF desktop application interface, showing an inbox and detailed views of messages and contacts.

Left Sidebar (Collection):

- Sharing a property: Creator Karger (36), RDF Type Message (40)
- Refine Collection
- Body Content: Groups (2), Thanks (2), ...
- Body Creator: Karger (2)
- Body RDF Type: HTTP Content (2), Note (2)
- Date: Est (2), Nov (2)
- Sent: Est (2), Nov (2)

E-mail:

- Compose Talk Announcement
- Compose e-mail message
- Existing Messaging and news connections
- Import inbox from Outlook
- Inbox
- Synchronize mail
- Mail categories
- History

Bottom Left: Create a project workspace

Top Bar: Haystack, Back, Go to, Search for, Starting Points, Information Sources

Inbox View:

From	Title	Date	Recommended categories
Hari Balakrishnan [hari@csail.mit.edu]	RE: bitmap figures in latex?	10:08 PM	<input type="checkbox"/> High importance <input checked="" type="checkbox"/> Inbox <input type="checkbox"/> To-do list
No items in list	Jaime Teevan	No item...	<input type="checkbox"/> High importance <input checked="" type="checkbox"/> Inbox <input type="checkbox"/> To-do list
Karun Bakshi [kbakshi@mit.edu]	Google Scholars	8:31 PM	<input type="checkbox"/> High importance <input checked="" type="checkbox"/> Inbox <input type="checkbox"/> To-do list
Jaime Teevan [teevan@csail.mit.edu]	SWIRL: Talks on Inform		
RSS feed "Slashdot: "	The Worst Jobs in Scie		

Right Side (Detailed Views):

- Hari Balakrishnan:** Hari Balakrishnan, Messages to this person, Messages from this person, RE: bitmap figures in latex?
- Google Scholars:** Google Scholars, Body (I think someone sent out a blurb about this...in any case, if you have not already, try out scholar.google.com...it's pretty cool!), Karun, Attachments, Recommended categories
- Robert Krauthgamer:** Person: Robert Krauthgamer [robi@almaden.ibm.com], Mail Endpoint Specification: Robert Krauthgamer [robi@almaden.ibm.com], List, Asynchronous message: Re: visit to MIT, List, Collection: Inbox

Role Mgmt. for students, 2004

Frequent functions for school calendar

Semester overview (current subrole's events highlighted)

School Role - Calendar

File Edit View Options Roles Help

General School Work New Role...

Schedule Find More

E-Mail Calendar Directories

Semester FALL 2002

Week Starting November 3 2002

Day 11 6 02

Wednesday November 6

11:00 am

12:00 pm

1:00 pm ANTH 240 annotated bibliography due today Location BSB1145

2:00 pm ENEE 408E - Section 0101 Location ENEE1012

3:00 pm ENEE 435 - Section 0101 Location ENEE1010

4:00 pm Gemstone - Section 0101 Location APW4425

5:00 pm Gemstone - Section 0101 Location APW4425

University News

- Myself vs Date formatted
- Student/teacher link with predicted grade

Current view selection (some are role-specific)

ENEE 435

- 1st DQ due
- Paul Chapter 7 - 8 to read
- One CANCELLED L10

ENEE 408E

- Paul DQs

ENEE 490

- Homework available in robusta
- Paul 6.2-6.7
- Homework available for pickup

Gemstone

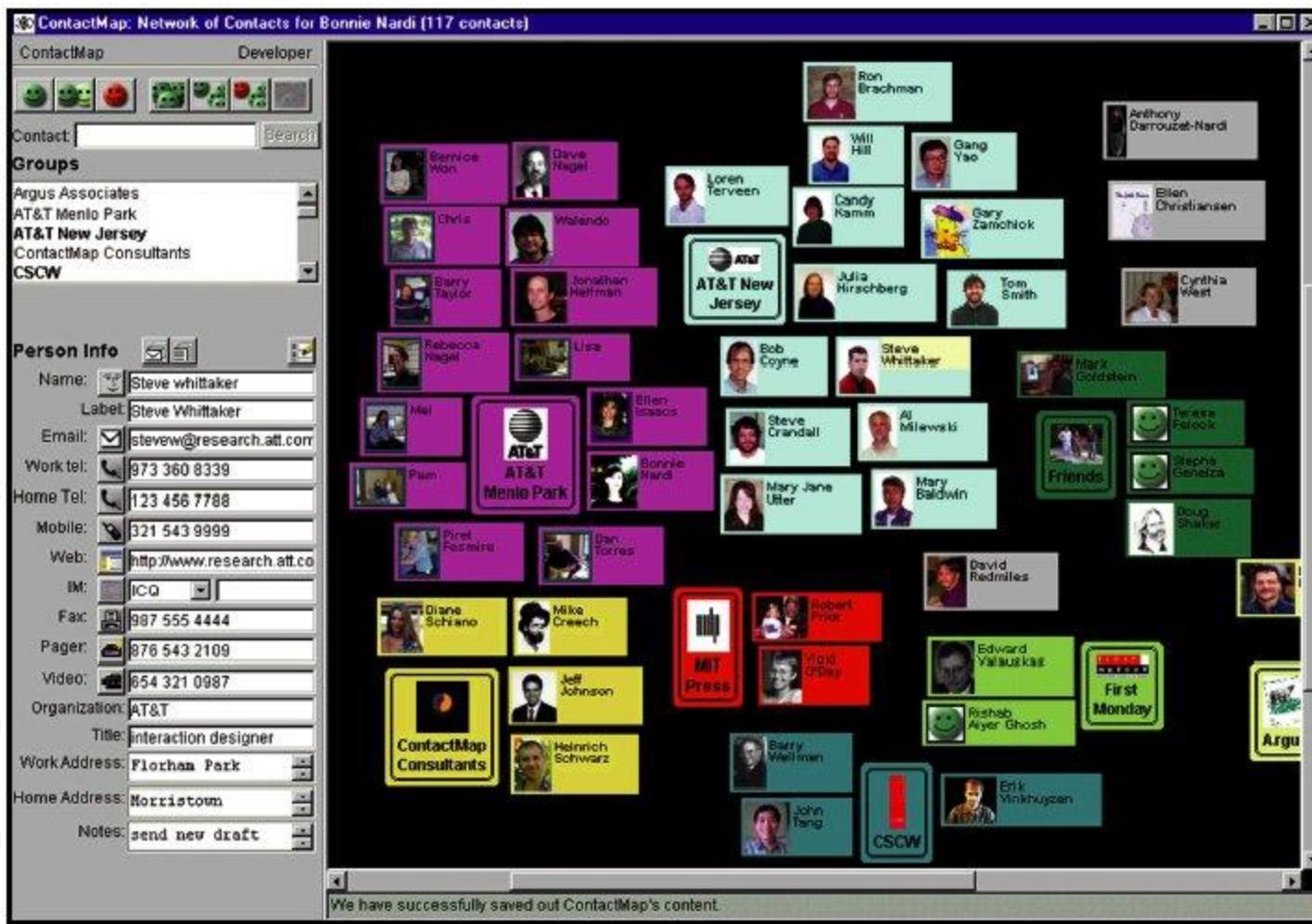
- Survey audience with
- Get ready for midterms
- rough draft of business card

E-Mail 6 New Messages

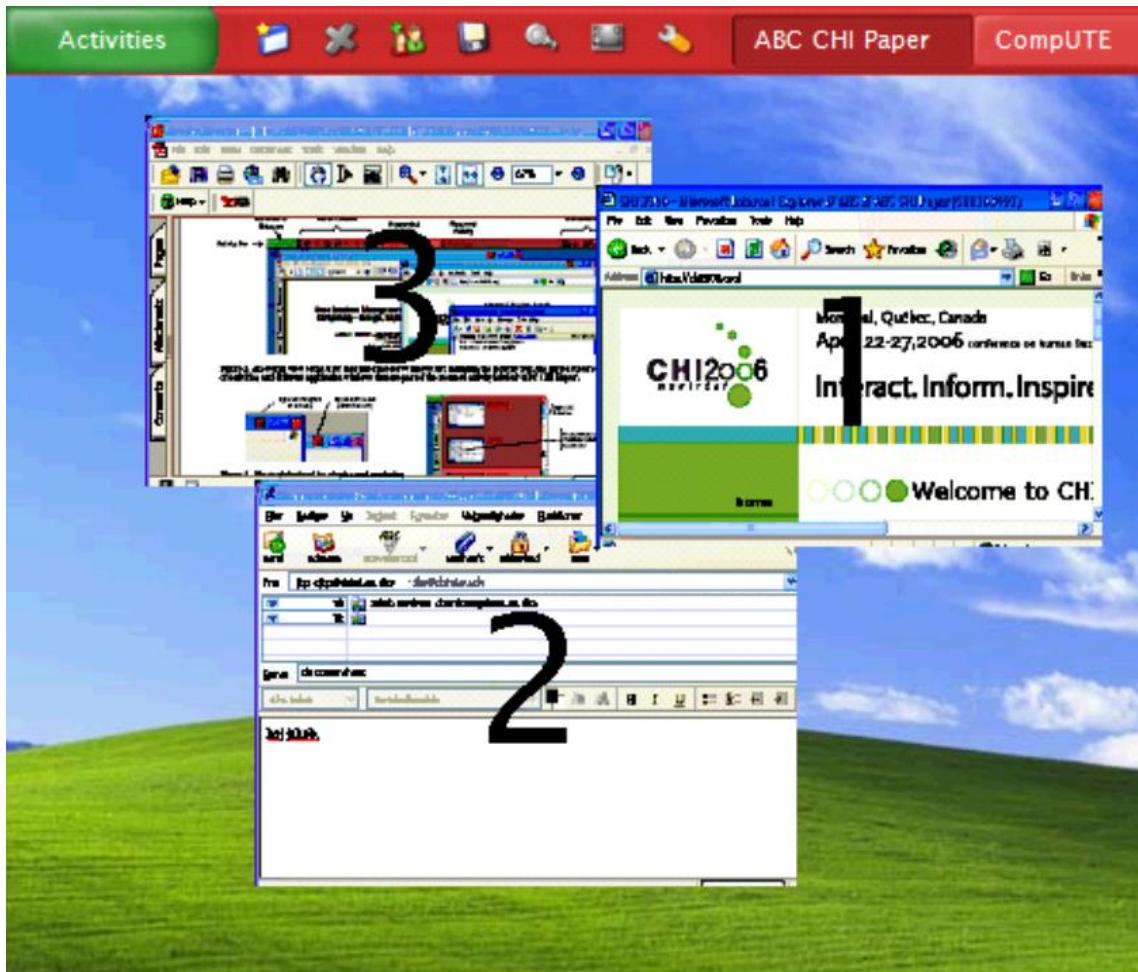
Current subrole can be selected here

Reminder from non-visible mail view

People Net - ContactMap, 2002



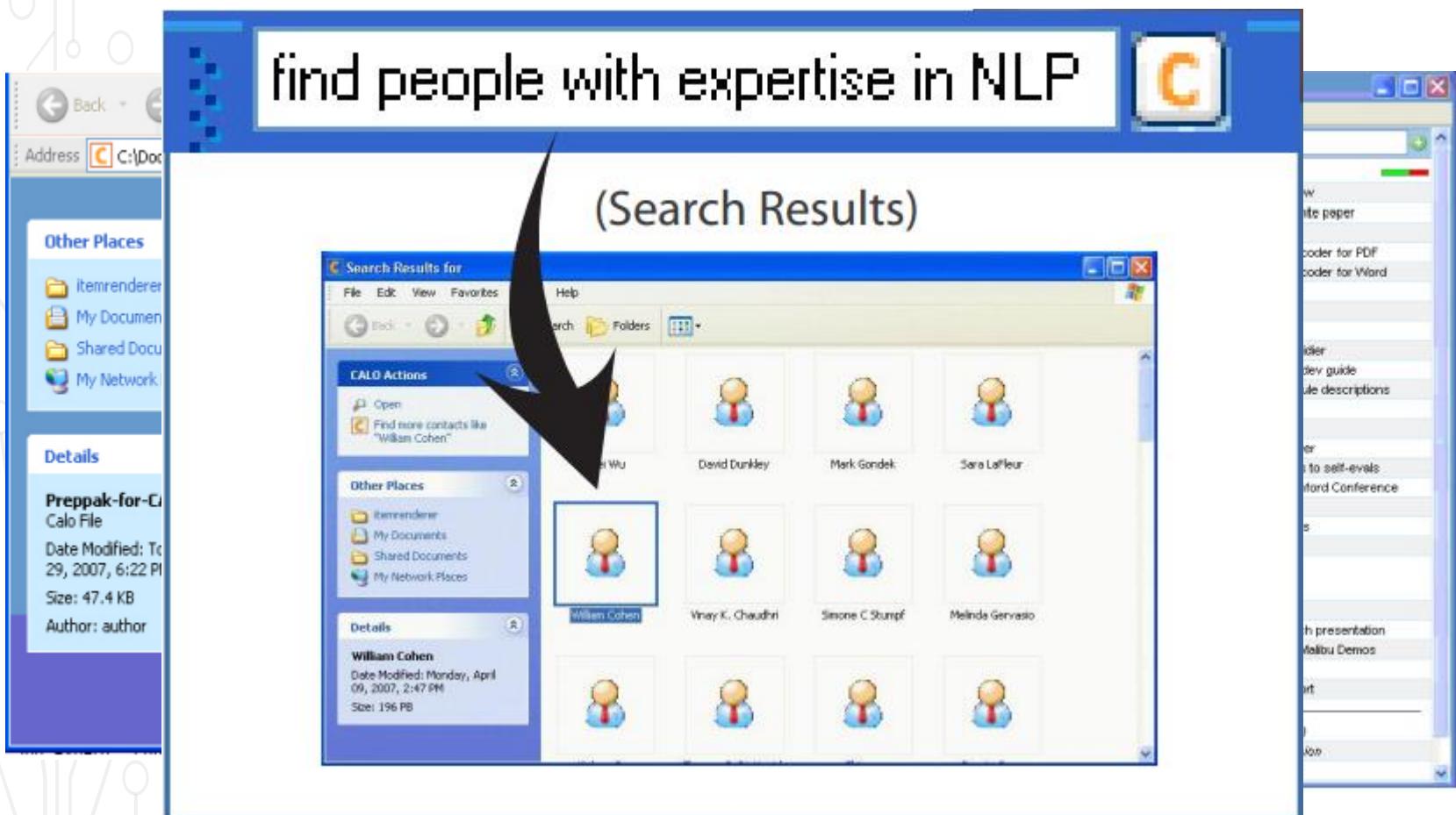
ABC/Activities - 2002



Activities Spaces - Kimura, 2002



ASSISTANT - DARPA PAL, 2000s

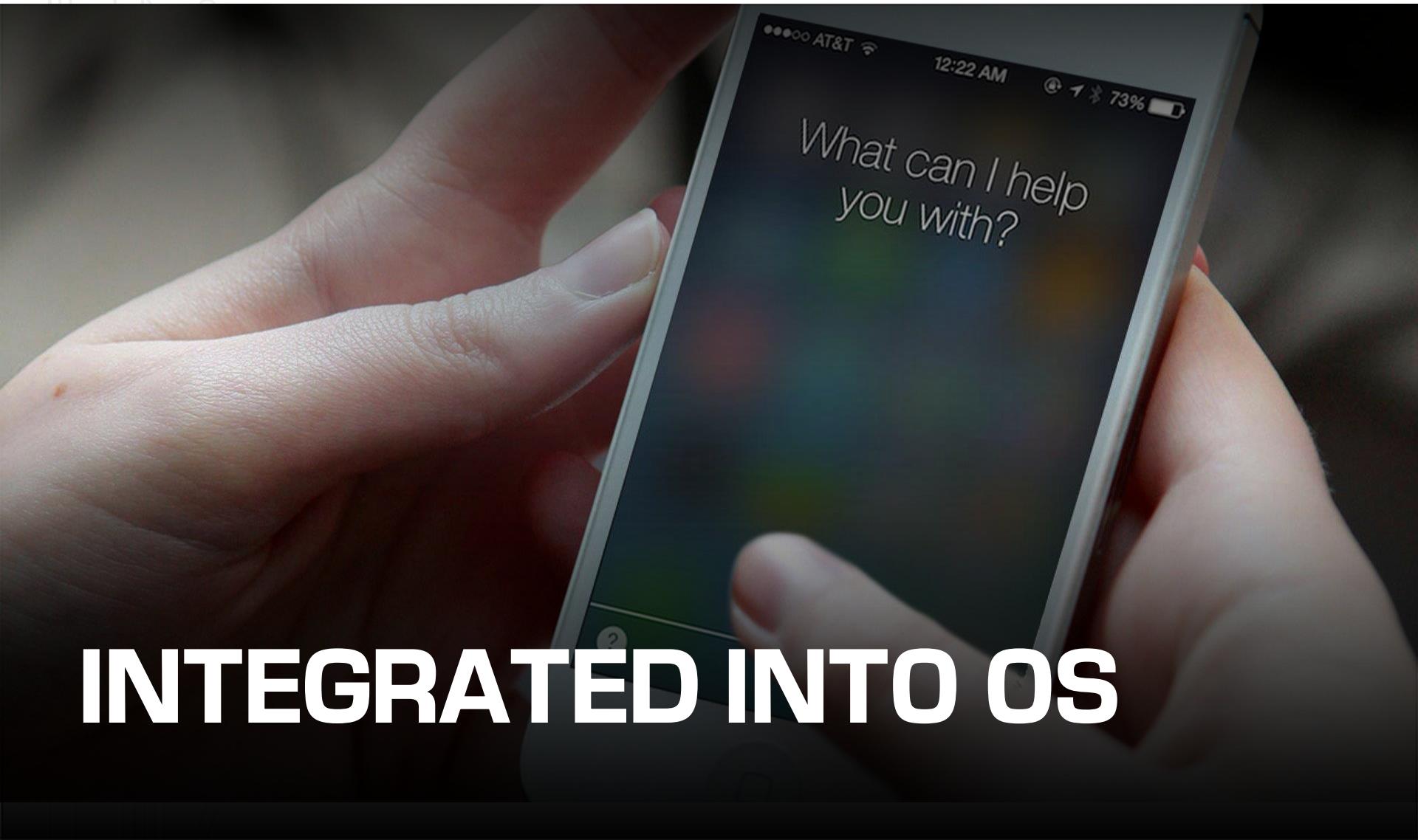




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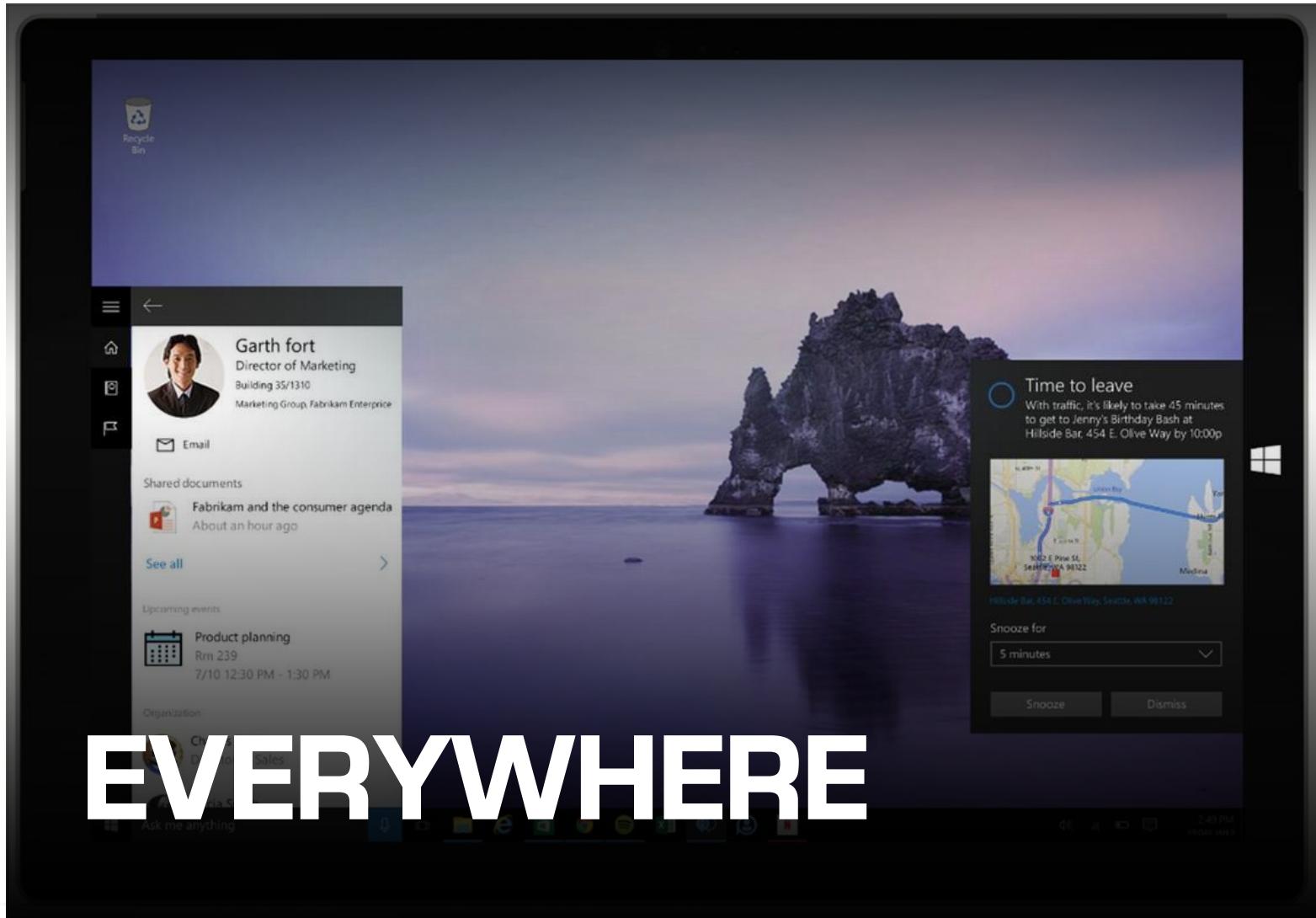
AI ASSISTANTS

VOICE ASSISTANT - SIRI, 2009



INTEGRATED INTO OS

AI ASSISTANT- CORTANA, 2012





DIGITAL WORK ENVIRONMENTS

WHAT'S NEXT?

DIGITAL WORK ENVIRONMENT?

- Personal and Group-based AI Assistant
- Works everywhere, w. AR/VR as target
- Preserves knowledge in Visual Memory
- Knows user priorities & ontology
- Protects from interruptions

DIGITAL WORK ENVIRONMENTS WILL BE EMBEDDED INTO THE BRAIN

A man in a dark suit is shown in profile, looking at a floating, translucent digital interface. The interface displays various data and code. Another man in a suit is standing behind him, looking on. The scene is set in a dark, futuristic environment.

CORTICAL MODEM ENABLES CYBER PROJECTIONS



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