



## Wireless PDAs (Communicators)

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# Agenda



- What is a communicator?
- Hardware that makes up a communicator.
  - Focus on design decisions
- Applications that make a communicator.
  - Focus on internet, email, and phone integration

# The problem



People want access to their personal data,  
wireless data and voice wherever they are.

...but it's inconvenient for them to carry  
multiple devices.

# The proof



How many of you own, or want to own these things?

Cell phone



Organizer



Email



Wireless Internet



We all would like to walk around with the functionality of 2-3 devices

# Good news...Communicators are here

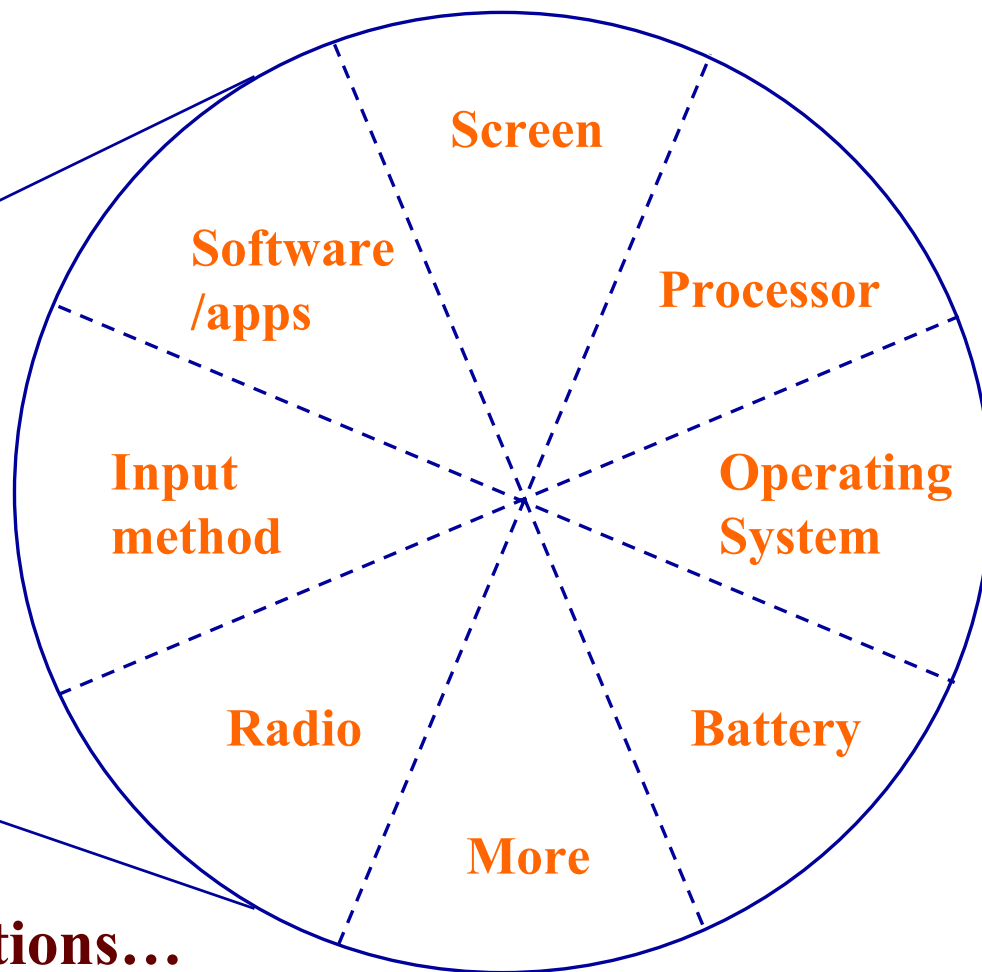


**...but which one is right for you?**

# What makes up a communicator?



**Each technology is an opportunity and a cost**



**Let's look at some of the design tradeoff considerations...**

# Radio



## GSM

### Benefits

- Worldwide std
- Cost of parts lower

### Trade offs

- Not prevalent in US
- Slower data speeds

## CDMA

- Large US deployment
- Faster data

- Not prevalent worldwide
- Higher cost

## Bluetooth

- Good wire replacement
- P2P functionality

- Cost to us still high
- Small installed base

## 802.11

- Cost effective vs. cell phone
- High bandwidth

- Small installed base- clients & “hot spots”
- Large power drain



# Handspring design decision:

## Radio



- **Largest worldwide installed base of technology**
- **Data speeds were good enough for the applications**
- **US carriers (AT&T, Cingular, T-mobile) claimed quick, nationwide rollouts**
- **We could build a CDMA device later**

**Hindsight is: 20/20**



# Screen



## STN

### Super Twisted Nematic

#### Benefits

- Inexpensive
- Tried and tested by us, including software work.

#### Trade offs

- Slower response time
- Worse color saturation



## TFT

### Thin Film Transistor

- Fast response time
- Higher contrast ratio
- Trend toward TFT technology

- More expensive (20%)



# Handspring design decision:

## Screen



### **Balance:**

Sunlight readability, resolution, color saturation, brightness, and cost

### **Many tradeoffs are linear:**

ex.. Any increase in sunlight readability decreases the brightness of the screen

### **Cost was a big factor:**

\$10 increase in cost to us is a \$30 increase in cost to the customer.



STN



Balance of “**good enough**” and **less expensive**.

High resolution TFT displays are great for multimedia applications... but **our customers mainly want to check their calendars, make phone calls, and read their email.**

# Battery



## Alkaline (AAA)

### Benefits

- Easily replaceable
- High capacity

### Trade offs

- Expensive if you are using a lot of power, frequently



## Lithium Ion

- More established
- Less expensive
- Standard parts

- Simple tradeoff- size of rectangle vs. power capacity



## Lithium Polymer

- Flexible size
- Better capacity soon

- Higher cost
- Less established



# Handspring design decision:

## Battery



### Balance

Cost, form factor impact, capacity (talk time).

### Decision 1

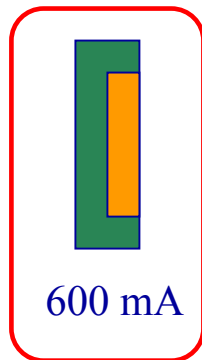
The radio is high power, constant use: Eliminated Alkaline

### Decision 2

Li-poly was not yet well established – added risk to the product.

### Decision 3

Li-Ion has linear trade off- size vs. capacity.



850 mA



1000 mA

# Input method



## Keypad

### Benefits

- Standard for phones
- Optimized for dialing numbers

### Trade offs

- Inflexible, difficult to enter data

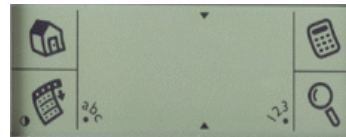


Hello = 44, 33,  
555, 555, 666

## Graffiti

- Established Palm OS user base
- Well recognized method
- Lower perceived complexity

- Slower data input



hELLO

## Keyboard

- Established RIM user base
- Fast for data entry

- Not used on Palm OS
- High perceived complexity



# Handspring design decision:

## Input method



### Balance

Perceived complexity, data input speed, ease of upgrade from current customers

### We knew

Data would drive Treo usage – email, PIM, applications

Keyboard was *much* faster

### But...

User testing showed the 50% want keyboard, 50% Graffiti

85% of sales for keyboard

### Lesson:

Customers don't always “know” what they want... **good thing we had a “hunch”**



# The end result

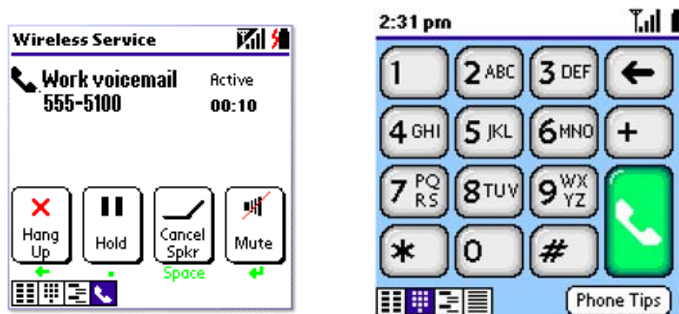


....let's look at the applications

# Applications of great communicator



## Powerful phone



## SMS and Email



## Internet

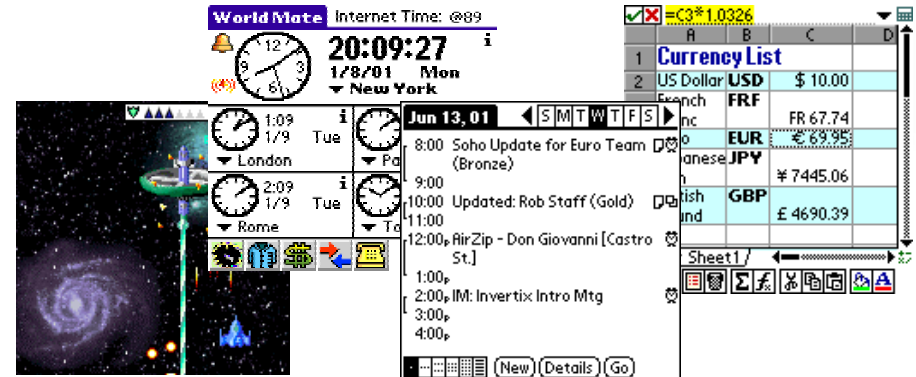


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Miguel Tejada rode a red hot September to win the AL MVP award by a wide margin. Tejada got



## Palm OS Apps





# Communication applications

## Phone integration



- Integrated with Internet, email, and SMS
- Simple conference calling
- Instantly look up and dial, from thousands of contacts
- Customizable ringtones
- Detailed call history
- Easy speed dials
- Mute calls

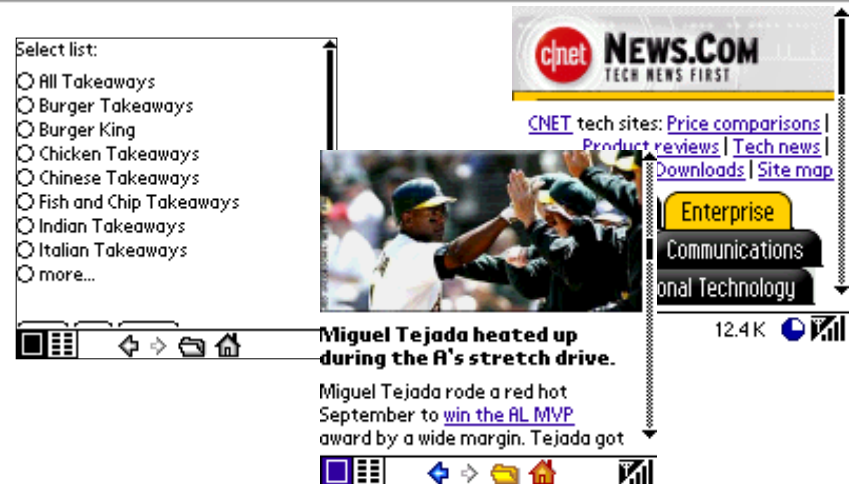


# Communication applications

## Web Browsing



- Web Browser
  - Integrated with SMS & email
  - Full HTML
  - One-handed navigation
  - Bright color display
  - Fast-loading with GPRS & Vision



**PC makers rev up 3GHz releases**  
 By [John G. Spooner](#)  
 Staff Writer, CNET News.com  
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It may be a year before the 3GHz

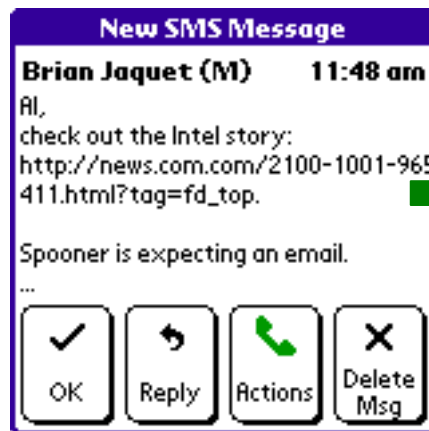


# Communication applications

## SMS Messaging



- SMS and a whole lot more
  - Integrated with phone, Treo Mail and Blazer
    - Call the sender, launch a web page, or send email to any address in message
  - Send to phone numbers and email addresses
  - Fast, familiar input, plus one-handed viewing



# Communication applications

## e-Mail



A lot to think about...

POP3

Desktop redirected corporate email

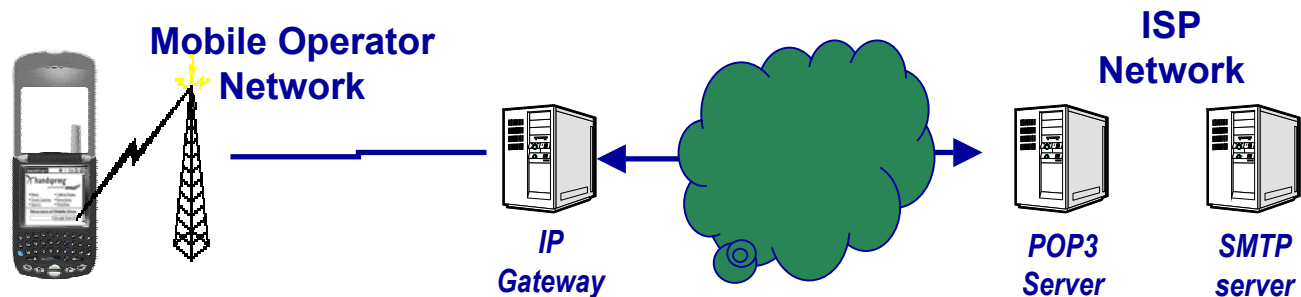
Server managed corporate email

# Communication applications

## e-Mail: POP3



### What it is:



### What's important to think about:

SSL support  
SMTP authentication  
User interface

Cost/ Service Fees  
Features: ex Auto checking

### Where can I get it:

Handspring Treo Mail  
Coresoft Aileron  
More...

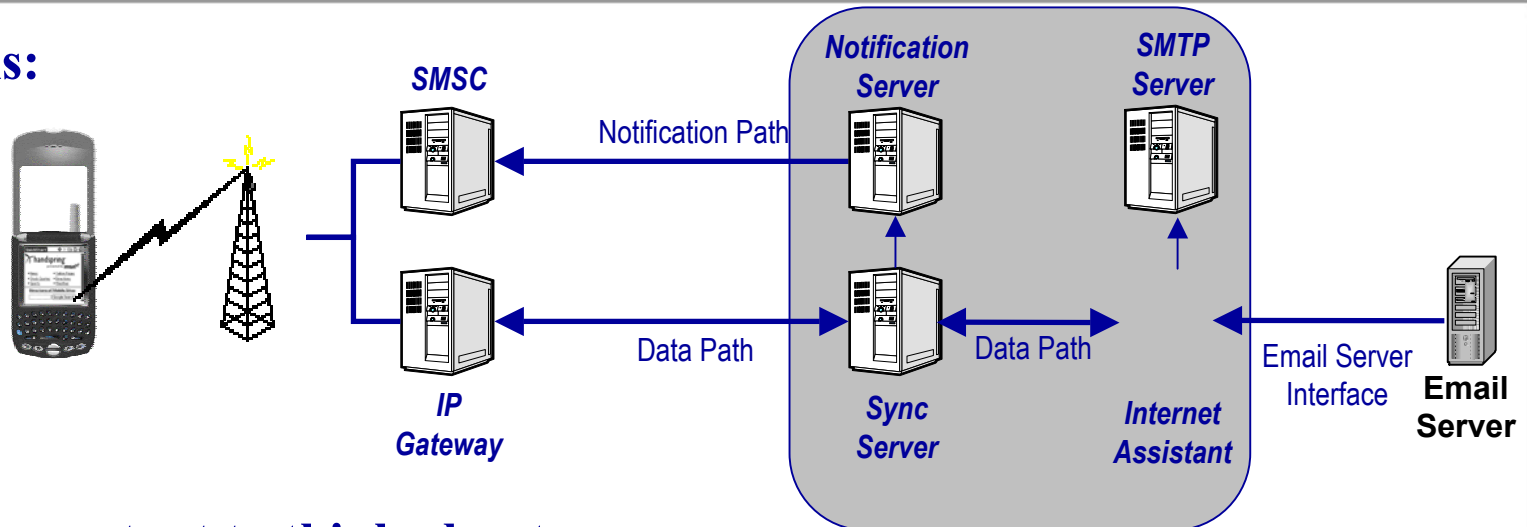
Snappermail  
Mark/Space mail  
More...

# Communication applications

## e-Mail: Desktop redirected corporate



### What it is:



### What's important to think about:

No need to tell IT  
Leaving computer on  
Security, compression

“Push”  
Costs/Fees  
Auto checking, etc/

### Where can I get it:

Handspring Treo Mail  
Wireless carrier  
Infowave

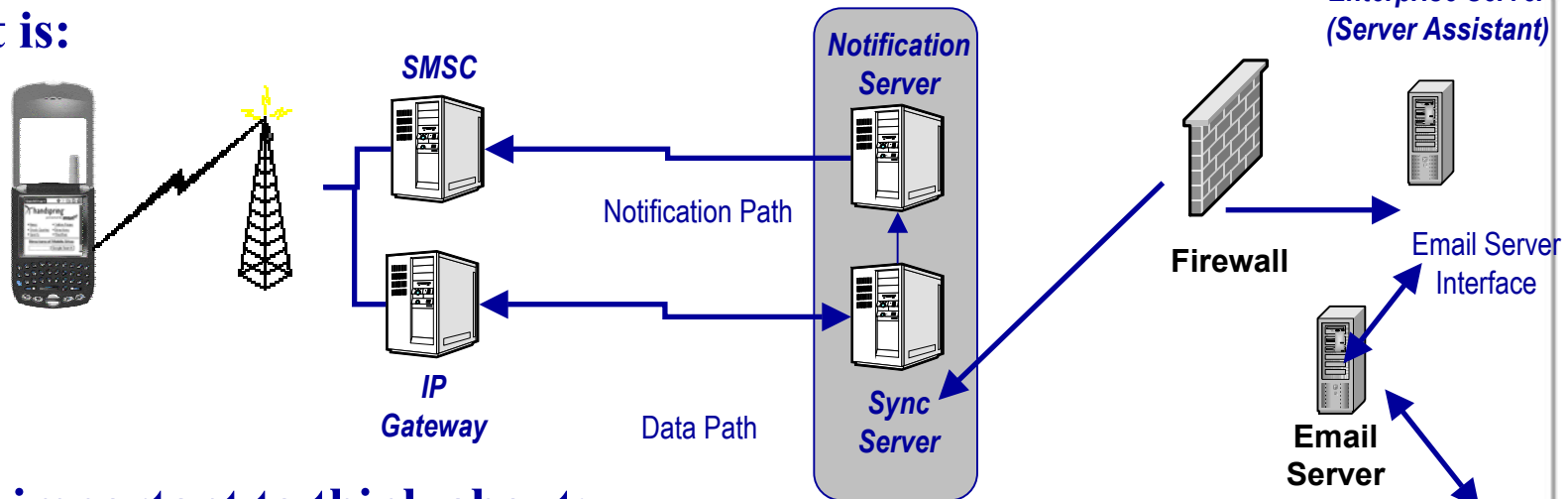
Wireless Knowledge  
RIM  
More...

# Communication applications

## e-Mail: Server managed corporate



### What it is:



### What's important to think about:

IT must install  
No need to leave comp on.  
Scalability – more powerful

Cost  
Features: ex Auto checking

### Where can I get it:

Wireless carriers  
Visto  
Extended Systems

RIM  
Good technologies  
More...

# Communication applications

## e-Mail: A closer look

treo mail.

### Treo Mail

- Easy UI
- Integrated with
  - Phone
  - SMS
  - Blazer

The screenshot displays the Treo Mail interface. At the top right is the 'treo mail.' logo. The main area shows an email from 'Brian Jaquet' with the subject 'Conference call'. The email body contains the text: 'Allen, the number for the call is 800-328-2483. We'll start at 9:00. Brian Sent from my Treo http://www.handspring.com'. Red circles highlight the sender's email address, the phone number, and the URL. Below the email are 'Done', 'Reply', and 'Delete' buttons. To the right is a 'Mail' inbox list with several messages. Below the email is a 'New Message' form with fields for 'To', 'Cc', 'Subj', and 'Body'. At the bottom left is a 'Cingular Wireless' status bar with 'Dialing' and the number '1-800-328-2483'. Below that are 'Hang Up', 'Spkr-phone', and 'Mute' buttons. At the bottom center is the 'handspring™' logo and a menu with 'Home', 'Products', 'Communicators', and 'Treo 300'. At the bottom right are 'Send', 'Send Later', and 'Cancel' buttons. Red arrows point from the highlighted elements in the email to the corresponding elements in the 'New Message' form.



# Many options today



## Lots of different hardware and applications....



**Miguel Tejada heated up during the A's stretch drive.**

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Contacts 3:54

All Contacts

# a b c d e f g h i j k l m n o p q r s t u v w x y z

Adell, Jeff +1 (234) 567-89... w

Akers, Kim +1 (345) 678-90... w

Anderson, Amy +1 (456) 789-01... w

Atkinson, Teresa +1 (567) 891-23... w

SIM Manager 57-89... w

Save To SIM 57-89... w

Send SMS 57-89... w

Create Copy 57-89... w

Delete Contact 57-89... w

Send E-mail to Contact... 57-89... w

Beam Contact... 57-89... w

Call Work Tel 57-89... w

Add Speed Dial Work Tel

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	A	B	C	D
1	<b>Currency List</b>			
2	US Dollar	USD	\$	10.00
3	French Franc	FRF	FR	67.74
4	Euro	EUR	€	69.98
5	Japanese Yen	JPY	¥	7445.06
6	British Pound	GBP	£	4690.39
7				

Sheet1

1

Orange 3:10 PM

No upcoming appointments.

SMS(5) MMS(3) e-mail(10)

News Gallery

Sport Downloads

Profile: Normal

Programs Contacts

Bill Gates

Last name: Gates

First name: Bill

Company: Microsoft

Job title: Chairman

Tel (Private): 997

Tel (Business): 112

TelGSM (Private): 0 700 122 221

Change

Add field

Remove picture

Close

...which ones are right for you?