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The Future of Software Engineering on Mobile Devices

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smartphones outsell PCs

smartphones might be first and possibly only computing device for many people

smartphones perform many common PC tasks
smartphone specs

<table>
<thead>
<tr>
<th></th>
<th>iPhone 4</th>
<th>minimum Windows Phone 7 specs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>?</td>
<td>800 Mhz</td>
</tr>
<tr>
<td>Display</td>
<td>960x640</td>
<td>800x480</td>
</tr>
<tr>
<td>Memory</td>
<td>512 MB</td>
<td>256 MB</td>
</tr>
<tr>
<td>“Disk”</td>
<td>16-64 GB</td>
<td>8 GB</td>
</tr>
</tbody>
</table>

more than your PC:

hardware-accelerated graphics, touchscreen

WiFi, cellular (GSM 3G or CDMA), bluetooth

high-resolution camera(s)

GPS, accelerometer, gyroscope, compass, ambient light sensor, proximity sensor, FM tuner, ...
smartphone uses

- text messaging
- taking photos
- internet browsing
- emailing
- downloading apps
- gaming
- social networking
- navigating
- watching video

what’s not on the list?

writing code, creating apps!
walled garden

many platforms only allow user to run apps from vetted “app store” or “Marketplace”

have you already tried to create a mobile app?
script your phone with touchdevelop

bringing the joy of programming from early computers to modern mobile devices
a touch-based IDE in your pocket

touchdevelop is an app to create, share, run scripts
everything happens on your phone — no PC required!
touchdevelop

demo

introduction to Windows Phone
introduction to touchdevelop app
basic program editing
song shaker
5,000+ scripts written by touchdevelop users
...games

5,000+ scripts written by touchdevelop users
touch develop
demo
scripts written by users
it’s fun!

engaging experience

work with your personal data (pictures, songs, ...)

create games, tools, automate tasks

on the go

great for teaching
language + editor

typed language + semi-structured editor

powerful language (not just for games)

auto-completion based on crowd-sourcing

imperative, procedural, datastructures

...and yet somewhat different from all other languages...
all phone features are available via touchdevelop

camera, touch, accelerometer, compass, gyroscope, microphone, ...

contacts, calendar, email, pictures, songs, ...

web queries, search, maps, social networks

graphics with physics engine
tiles
script bazaar

central authority in cloud
anyone can publish scripts
you can discover other scripts
scripts come with source code
all published scripts are automatically analyzed for privacy concerns
social

programming: a social experience

user profile
discuss in forum
review
screenshots
give ❤️ to scripts
notifications
PC – legacy development model
Android: AIDE, App Inventor, ...
iOS: Codea

mobile development environments are becoming popular on all platforms
only **touch**develop embraces new devices (touchscreen, editor, language, social)
... and back to **touchdevelop**

resources for learning and teaching

how to become famous and get rich

beyond phones
book + slides

available free online

touchdevelop.com/book
touchdevelop.com/slides

introduction to programming on a phone
how to use app + editor + language
for teachers + students
need phones?

University Phone Loan Program for touchdevelop

are you interested in using touchdevelop for teaching...
  basic programming concepts?
  mobile computing classes?
  compiler and languages classes?
  investigating the touchdevelop language?

loan program: get Windows Phones for a semester.
how to apply: touchdevelop.com/teach
submit your scripts as real apps to Windows Phone Marketplace!

requires App Hub developer account (free for students via Dreamspark)
app needs to pass regular certification process on App Hub

app download
step 2: download app and screenshots
2.1: download app
save this file on your disk: TouchDevelop_mpuj.xaml
2.2: download app
you will be prompted if you want to open or save TouchDevelop_mpuj.xaml (1.27 MB) from www.touchdevelop.com

Learn more...
beyond phones
research opportunities...

user interfaces
clone analysis
privacy concerns
plug-ins
distributed state, distributed execution
touchdevelop is popular (released April 2011)

> 180K app downloads; in top 1% of all apps (out of 80,000) of Windows Phone Marketplace
rated 4.5/5 by users

great for learning
it’s fun! immediate feedback. show your friends what you do on your phone
manipulate your own data (songs, pictures, etc.)

embraces new reality

language and editor optimized for touchscreen
first-class access to all sensors and services
sharing and learning with friends in the cloud
questions?

touchdevelop.com
research.microsoft.com/touchdevelop