ICE–CREAM SANDWICH – A CASE STUDY

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ANDROID ICE–CREAM SANDWICH

Ice Cream Sandwich is the dessert-themed Android codename for version 4.0 of the open-source Android mobile operating system. Android 4.0 delivers a refined, unified UI for phones and tablets and introduces innovative features for users and developers. This document provides a glimpse of the many new features and technologies that make Android 4.0 simple, beautiful, and beyond smart. It made its debut in October 2011 as Google's operating system for smartphones, tablets, and other mobile devices.

In February 2011 Google released a tablet-only version of their Android operating system codenamed "Honeycomb". This included changes to the user interface to support large screen devices and was incompatible with phone-sized devices. Due to this fragmentation of operating system versions, problems have been developed leading to inconsistent user interfaces, a difficult job for developers and most importantly disappointing experiences for users.

In October 2011, Google released a new version of their Android operating system codenamed "Ice Cream Sandwich" (ICS). This release combines the tablet-specific changes of Honeycomb with updated mobile phone functionality to create a single operating system that runs on a remarkably wide range of Android devices.

FINDINGS

Android 4.0 was focused on simplifying and modernizing the overall Android experience around a new set of human interface guidelines.

It introduced a new visual appearance codenamed "Holo", which is built around a cleaner, minimalist design, and a new default typeface named Roboto. It also introduced a number of other new features, including a refreshed home screen, near-field communication (NFC) support and the ability to "beam" content to another user using the technology, an updated web browser, a new contacts manager with social network integration, the ability to access the camera and control music playback from the lock screen, visual voicemail support, face recognition for device unlocking ("Face Unlock") and other internal improvements.

It also includes an application programming interface (API) for virtual private network (VPN) integration and an app that monitors mobile data usage. It also offers a new user interface, advanced camera features, and an improved native email app.

Android 4.0 brings a unified UI framework that lets developers create elegant, innovative apps for phones, tablets, and -

more. For developers, the unified UI framework in Android 4.0 means new UI tools, consistent design practices, simplified code and resources, and streamlined development across the range of Android-powered devices.

KEY POINTS

1. Front buttons go bye-bye
ICS forgoes the need for physical Back, Home, Menu and Search buttons by integrating a new System Bar at the bottom of the screen.

2. Multitasking better than iOS
That Recent Apps button really comes in handy, displaying thumbnails of open apps in a vertical stack that you can easily scroll through. Even better, you can just swipe an app off the screen to close it.

3. Face unlock
There's probably no easier way to unlock a phone than staring at it, and that's exactly what ICS lets you do.

4. Resizable widgets
Ice Cream Sandwich wants to put widgets more front and center, which is why you see a Widgets tab when you open the Apps menu. Plus, you can resize widgets just by pressing and holding on them and then dragging any one of the corner.

5. Notifications clean up their act
You can dismiss individual notifications by just swiping them off the screen, as opposed to needing to clear them all at once.

6. People app gives contacts a makeover
A new People app in ICS is more inviting than your typical address book, providing a large profile along with social networking integration.

7. Respond to calls with a text
Android ICS makes it easy to ignore incoming calls without being rude. If you're too busy to answer, just swipe up and you'll see a list of canned text messages you can tap.

8. Just beam it
This feature will take a while to take off, but we love the idea. Provided your Ice Cream Sandwich phone has an NFC (near field communications) chip inside, you can transmit info to other phones running the latest Android OS just by touching the two together.

IMPLEMENTATION

New widgets, new gestures, context-sensitive action bars, more discoverable commands - these are just the tip of the iceberg.

1. **New system font**. Android 4 sports a new typeface called "Roboto" which was designed especially for high-resolution screens like the one found on the Galaxy Nexus. By putting a new emphasis on typography,
2. **Screenshots**. Hold down the power and volume down buttons to capture a screenshot of the currently running application.
3. **Home screen improvements**. The Android home screen got a lot of love in Android 4. Other new features include the ability to create a folder by dragging one icon on top of another, and a customizable quick action bar at the bottom of the screen. You can press a button in any screen to see recent apps and swipe them to the side to close them.
4. **Instant voice**. Android 4 gets rid of delays with a cool feature called Instant Voice. Now you press the button and start talking and the text starts appearing while you are still talking.
5. **Unified API for Tablets and Phones.** Android 4 is for both phones and tablets.
6. **Social API.** They provide an open API so the providers can plug themselves in, and developers can share content with or invite members to those social platforms without having to know them by name.
7. **Android Beam.** Based on an NFC (near field communication) technology called NDEF Push, two Android phones in close proximity (about 4cm) can securely exchange contacts, web pages, videos, or any other application-defined information you can imagine.
8. **Accessibility.** The big one is an explore-by-touch mode that lets users with vision loss explore the screen by touching and dragging a finger across the screen to hear voice descriptions of the content. Handshakes between your app and the Accessibility framework provide additional information for screen readers.
9. **VPN client API.** Now vendors like Cisco can make pluggable VPN providers that install just like regular apps without requiring root access or special agreements with the manufacturers.

LIMITATIONS

There are two disadvantages to using OS ICS. First, the disadvantage is face unlock. Face unlock is the new feature from operating system -

ICS. The disadvantage is, smartphone can be opened by someone using a photo of the smartphone owner.

Second, the disadvantage is minimum requirement. For using Operating System Ice Cream Sandwich, smartphone must behave minimum 1Ghz processor and 512 MB RAM. It is two disadvantages of using operating system Ice Cream Sandwich.

ADVANTAGES

Core UI
- Fragments and content loaders
- Resizeable home screen widgets
- Rich notifications
- Multi-selection, drag-drop, clipboard
- Improved screen-support API
- Hardware-accelerated 2D graphics

Graphics and animation
- Property-based animation
- Renderscript 3D graphics

Media and connectivity
- HTTP Live streaming
- Bluetooth A2DP and HSP devices
- Support for RTP
- MTP/PTP file transfer
- DRM framework
- Input from keyboard, mouse, gamepad, joystick

Enterprise
- Full device encryption
- DPM policies for encrypted storage and passwords

RECCOMENDATION

The first major issue is with its new face unlock feature. It sounds so good but it's more worse as it is a major threat to the security of the user as anyone can unlock the device using a photo of the user and can use the device according to his will.
This could be fixed using an update as it is a software issue. They can make it more secure or they remove it and update it on the new devices and in their new upgraded os.

The second major issue is with it had requirements from the device. The device should have a minimum 1Gz processor and 512 MB ram Which was only in high-end devices. This could have been fixed by just reducing the minimum requirement of the os so that it could be used by the majority of users and in mid-range devices too. Although Google has offered up and the base level of performance on the show. Ice-cream Sandwich was the most accessible and easy-to-learn OS from Google, and that's going to be key in the wars against Apple and Microsoft. It was also the turning point in making Android a real player in the top-end smartphone market, and for that, we give it a huge thumbs up.

OBSERVATION

Android Version	Release Date	Key User features added	Key developer	API level
Android 4.0	2011 Oct 18	New lock screen actions Improved text input and spell-checking Control over network data Email app supports EAS v14 WI-FI direct Bluetooth Health Device Profile ADB Backups	Low-level streaming multimedia (Khronos OpenMAX AL Grid Layout Spell checking service Address Space Layout Randomization VPN client API Remote Device camera enable/disable ZSL exposure, continuous focus, and image zoom Flags to help control system ui elements like system bar from apps	14
Android 4.0.1	2011 Oct 19	Facial recognition (Face Unlock) UI use Hardware acceleration Better voice recognition (dictating/Voice typing) Web browser, allows up to 16 tabs	-	14

		Updated launcher (customizable) Android Beam app to exchange data through NFC		
Android 4.0.2	2011 Nov 28	Minor fixes	-	14
Android 4.0.3	2011 Dec 16	Social stream API in Contacts provider to show updates associated to your contacts Video stabilisation and QVGA video resolution API access Accessibility API refinements for screen readers Calendar provider updates	-	15
Android 4.0.4	2012 Mar 28	stability improvements better camera performance smoother screen rotation	-	15

CONCLUSION

The first thing you notice when you start using Ice Cream Sandwich is that Android suddenly seems a lot more friendly. While the OS has always been powerful and versatile, simple human relations weren't exactly its strong suit.

Although Ice Cream Sandwich had exciting features and tackled some of the longstanding issues such as fragmentation head-on, it still faded into obsolescence relatively soon. After seven years, Google decided to end the support for Android 4.0, also known as Ice Cream Sandwich (ICS) by stating "Ice Cream Sandwich's usage share has been below 1 percent for years, so the end of support won't affect many people". In fact, many apps and services had already stopped supporting ICS, and even services that claimed to have support were often busted. We can still see many features introduced by ICS in smartphones to this day including the navigation bar, face unlock, screenshot capture, and individually swipeable notifications. It also completely revamped the look and feel of the OS, which was all over the place before 4.0. All these years later, it looks and feels pretty old.

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