

White Paper

Comparison of Certain Mobile Phone User Interface Technologies

1. Advanced Toggle Key Systems

Example phone: Motorola V620¹

Image:



Discussion:

Most phones now have dual physical interfaces: (1) an alphanumeric keypad, and (2) a toggle key system that includes directional arrows and additional buttons. All toggle key systems have two basic things in common: (1) they are based fundamentally on a menu/select system, and (2) they require using the upper screen to show the menu and what is being selected.

The toggle key systems have inherent limitations, which include: (1) there is a limit to how much can be shown on the upper screen in terms of menus and sets of feature-specific commands; (2) users must traverse hierarchies of hidden screens and menus on the upper display to find out if something is available and how to do it; (3) these systems eat up the upper screen real estate, which is incredibly valuable real estate and should be reserved to the maximum extent for showing application/feature actual images (not the menus and commands to control them) - for instance, for games, the upper screen should show the game graphics; for camera, the upper screen should show the view from the lens; for TV and movies, the upper screen should show the images; for email and text, the upper screen show the text; etc.; (4) the user has to learn two sets of interfaces, the keypad and the toggle keys, which, as the toggle keys get more complicated and include more buttons, means an ever more complicated process for the

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user; and (5) toggle key systems do not offer an effective means to differentiate phones in the market because virtually all phones have some version of a toggle key system.

In sum, advanced toggle key systems do not offer a user-friendly solution for the need for a better user interface for mobile phones, and do not provide the service provider with the space on the upper screen that is needed to maximize the benefits of advanced data and multimedia and other telecoms services.

2. Voice Command Systems

Example phone: Samsung a560

Image:



Discussion:

A number of voice command systems are available and/or under development to address aspects of controlling mobile phones for users. We believe voice command is complementary to, and NOT a replacement of the need for, a physical keypad interface.

Voice command systems have inherent limitations. For instance: (1) they are not appropriate or effective in many user situations, such as on public transportation, in public spaces, in workplace environments with other people, and in noisy environments; (2) they are not a good tool when the phone is being used for a feature or application that produces audio, such as multimedia (games, TV, movies, etc.); and (3) the user has to somehow remember all the correct voice commands for every feature, which is very difficult except for the simplest context (“Call Home”) or a few features used very regularly.

Nevertheless, voice command systems probably do have a place, they simply are a feature that will be in addition to a full keypad interface, not a replacement of the need for a full keypad interface system.

3. Touchscreens

Example phone: Treo

Image:



Discussion:

Touchscreens (either alone or in conjunction with physical keypads) are another solution implemented on some phones to ease the user interface problem. However, these solutions present many of the same inherent difficulties as the advanced toggle systems discussed above because (1) they eat up critical space on the upper screen with user interface commands, graphics and menus instead of keeping that critically valuable space for applications and features such as game graphics; TV, camera and movie images, text documents, etc; and (2) they require the user to learn a third user interface in addition to the keypad and the toggle keys.

Further, touchscreens are inherently hard for users to use because (1) there is no touch differentiation among the choices displayed on the screen, and (2) there is not necessarily any predictable pattern across all features that the user can learn in one context and apply to all contexts (this is a critical feature of the Yuvee Keypad interface system - the patterns of use are always the same for any feature or application or service, existing or new, which means that once the user has learned the Yuvee Keypad interface system in one context, it is easy for the user to use anything else).

As discussed in the previous paragraph, a flat touchscreen means that the user has to press very specifically on a very specific part of the screen to activate some feature or command, and that part of the screen is not differentiated by touch in any way. This means the user has to stare very closely at the screen each time the user is pressing his/her finger on it, otherwise the user will almost certainly miss enter whatever they are trying to do. This imposes a very unfriendly environment for most users, who want to click with their thumbs while they are on the go.

4. Mini PC Keyboards

Example phone: Treo

Image:



Discussion:

Mini PC keyboards are another solution implemented on some PDA-type phones to ease the text entry user interface problem. However, these solutions have many inherent problems because (1) the size of the mini PC keyboard requires a phone that is larger than the vast majority of flip phones and candy bar phones; (2) it is a solution oriented only at text entry, when the user interface must address text entry and make every other feature and service easy (such as games, TV, multimedia, music, etc); (3) it requires many, many tiny little keys; (4) the keys are hard-labeled for a single specific language; (4) the keys do not make it easy to enter accented letters, editing commands, a whole range of symbols and punctuation (such as the Euro or dollar symbols), etc.

In short, mini PC keyboards are a solution limited to text entry and limited to larger PDA/phones, and still require extensive additional interface systems to make work. For instance, the Treo has a touchscreen and a toggle key system in addition to the entire mini PC keyboard - three entire user interface systems.

5. The Yuvee NeoKeys™ Interface System

Example Image:



No hard labeling on keys.

Dynamic displays above keys re-map based on the user's choice of feature

Every feature, service and application is made easy by making it easy for the user to see and select any feature and then enter the applicable commands, text and numbers.

Fits in virtually any phone design.

Opens entirely new horizons because it completely removes the limitations of any other user interface system.

(Note: many other key sizes, layouts, shapes and colors are possible - this is only one example implementation)

Discussion:

In contrast to all these other interfaces, the NeoKeys interface system:

- (1) makes every feature easy, including complete text (alphabet, punctuation, symbols, numbers and editing keys, in any language) and including any other feature or service of any kind;
- (2) reserves the maximum extent possible the upper screen for images, movies, game graphics, video, etc.;

(3) requires no memorization of commands by the user and no voice prompts, manuals, etc. because it displays above the keys exactly what the user needs to use the feature the user has chosen;

(4) has sets of keys dedicated to specific roles so that there are consistent patterns of usage that apply for every feature, service or application - so the user learns it for one feature and the user knows how to use if for EVERY feature now or in the future;

(5) fits in almost any phone and is designed around the 12 keys that every user is already familiar with;

(6) is programmable before and after sale to the user, so any application developer can make their application (game, service, etc) easy to use no matter how advanced it is;

(7) is flexible in its implementation so handsets can look different and still have the same user interface;

(8) puts the user in total control - the user is shown on the keypad just what the user needs to use the feature the user has chosen;

(9) enables the telecommunications service provider to provide even the most advanced services in a simple, intuitive, personal way far beyond the capability of any other system;

(10) it is the ONLY complete (commands, full text and numeric) user interface system integrated into a mobile phone keypad.