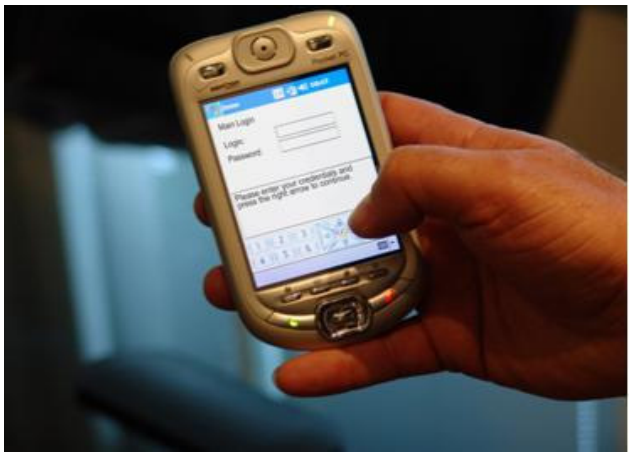
Zenu® – The Remote Control for the Internet™

Interaction Technology - A Protocol for Control

Preface



ChangeTools offers **Zenu** – an excellent tool for managing user interaction with applications and resources from multiple platforms. Zenu provides a uniform interface across each platform: desktop, laptop, PDA or mobile devices and Smartphones.

One of the problems with building applications for a wide range of platforms is the difference in screen size and capability that can exist between these platforms. Desktop and laptop systems have large screens and are usually 'connected' to data sources via a network. PDA's and mobile devices are much more limited. Another problem is in the way to update or deliver new applications to roaming devices such as PDA's or phones. We believe that we have developed a significantly simple solution to these and other problems. This solution works not only for mobile devices, but for desktops and laptops as well.

ChangeTools has developed a methodology to create a user interface on devices through the use of an XML document delivered to the user through a stream that can originate locally or remotely. In addition to enabling the user to send and receive information, Zenu also allows the resources of the device being used to become a part of the application. These resources are controlled in the same simple and intuitive manner as any other part of the application creating a much more powerful user experience. In most cases, the XML is delivered remotely from a server turning the mobile device into a simple portal into the actual application. This allows the configuration of the application to remain at the server where it can be updated by an administrator without the need to update each individual device if changes or new functionality have been added.

The above is a simplified summary of the work underway to extend into the virtual Internet space. Zenu is not limited to the devices upon which it is installed. Zenu provides great application and device access management, but also with the remote configuration capability, and wireless or LAN connections, it becomes an enterprise level portal managed at the server by the system administrator.

Abstract – Mobility

Data users are in the early stages of a great 'un-binding'. The era of the desk-bound worker is giving way to a more fluid, un-tethered, work environment. Performing serious tasks anywhere and at anytime is becoming a reality thanks in part to more robust networks that provide an ever increasing umbrella of coverage.

From the earliest days of computing until today, the primary vehicle for delivering and presenting information to users has been 'screens' of data (mainframes, mini-computers, PC's, laptops, and now the huge selection of mobile devices). Unlike the early days of computing, end users are now highly mobile, in time-critical situations, and in need of access to information 'on the fly' without stopping what they're doing. The 'always on' connection and miniaturization technologies have provided the necessary catalyst and basic premise of mobility.

Zenu has the ability to interact with multiple levels of information on any platform making it a true multi-dimensional interface for control

Now 'It' Boils Down to:

- choosing a suitable device that offers sufficient screen real estate to view and interact with information,
- small size and weight yet easy to use, and
- interoperability – 'in-sync' with systems at work, home and on the road.

Challenges

The real issues are how communication and information sharing enable the mobile enterprise allowing users to easily access information and accomplish tasks they want to do in a secure and intuitive manner. Getting information from where it is (usually on a server, desktop, or laptop) to where it needs to be (on a mobile device in the field) is not a big hurdle from a technology perspective as today's devices have more than enough memory, storage capacity, and processing power.

However, more daunting challenges do exist:

- How to develop consistent user interaction techniques that are common across platforms, scale across different devices, and are screen independent (from high resolution displays in command and control centers, to PC/laptops, and the increasing number of handheld devices with limited screen real-estate)?
- How to deliver task specific information to a wide variety of users effectively so they can interact most efficiently?
- How to develop application techniques that scale easily from single-user to a collaborative multi-user environment?
- How to develop oversimplified tools that are clear and are so easy-to-use that training demands are minimized and user attention is focused on the task at hand (rather than the mechanics of how the device or software works)?

- How data filtering and control, prior to it reaching a user, makes it possible to increase the volume and absorption of information without a user being overloaded?

It's not the technology that's impossible.
It's the training of people to use
the technology that's impossible.

Zenu Applications are so easy to comprehend that user training and 1-800 customer support is minimized and in some cases eliminated altogether.

The Internet – The Ultimate Information Delivery Platform
A good illustration of the great 'unbinding' mentioned earlier, is the commoditization of hardware and software. Bluetooth™ connectivity is leading to new futuristic hardware devices, flexible display panel technologies, WiFi enabled 'electronic paper', and many more, all acting in unison but in a disconcerted manner. This trend will continue as the hardware and software become totally immaterial with the ultimate goal of achieving bandwidth to the brain.

So:

- Always on broadband connections are becoming ubiquitous.
- People are now comfortable with interacting over the Internet.
- Web search has become the norm.
- Advertising or license-based revenue models are established.

For the enterprise owner and technology users of today, there is an overwhelming choice of hundreds of hardware devices – all with increasingly larger screens (look at the trend in smart phones and new cameras) and bristling with features that mainly satisfy engineers and marketing concerns rather than addressing the functional needs of the user. Add to this the challenges of network and platform compatibility, security, connectivity, bandwidth, power consumption (battery life), data synchronization, daylight readability, input issues, limited screen real estate, and you have a good summary of what Zenu was designed to address.

The future lies in the design, delivery, and control of user-centric, web-based applications that are delivered over an increasingly robust Internet.

What is Zenu?
Zenu is an user interaction methodology designed to provide users with an intuitive method of controlling application data.

Why should the average user care about how a device, computer, information appliance, and/or its software works? They shouldn't. Zenu places control of both the hardware and web-based applications in the hands of the user. By leveraging access to the internet, users can now download their own method of control (just like you use your TV remote control). This is the essence of Zenu.

Zenu is the un-binding
of control from the device.

Think of it as: **"Your _ _ _ _ _ _ _ _ _ _ Portal™"**

- Zenu is a patented, oversimplified, flexible, customizable yet consistent, and reliable method of interacting

- Zenu provides a superior mechanism for communication and control.

- Zenu maximizes the human capacity to perceive, understand, reason, and perform tasks in an intuitive, easy to use, error free manner.

- Zenu features a standard (but customizable) user interface that provides 'one place to look' so a user can control applications and devices in exactly the same simple manner regardless of device or location.

Users will tell you that a well-designed 'screen' is of utmost importance. It is the user's window into viewing the capabilities of the system and the information it presents. To many users, it is '*THE* system' – being one of the few visible components of the mobile device and also the screen through which many vital tasks in the form of applications are presented to the user for execution.

Recognizing that many, if not most, interfaces are confusing or simply unusable to the ordinary user, ChangeTools created Zenu – a breakthrough in control.

Zenu Is THE Window Into Your Device, Applications, and Data
Zenu is designed to provide a common experience regardless of user familiarity, operating system, or computing device. From the largest screen to the smallest, Zenu addresses and solves the major issues of 'technology overload' and 'friction' by keeping technology where it should be – invisible to the user. Thus, Zenu enables the adoption of many worthy technologies that until now have either fallen by the wayside or required unrealistic and costly training efforts to implement.

The ZenuSuite® – Mobilizing Applications
The **ZenuSuite** creates a mobile portal to access and work within complex enterprise information systems. Enterprise management moves from the desktop to the mobile device by providing developers with a new and flexible method of building mobile applications based on the **ZenuStack™**, a system of work flow templates that expose only the relevant information needed for the particular user to perform his or her task quickly, easily, and accurately with minimal 'clicks'.

- **The ZenuSuite was developed to allow enterprises to build and develop applications that are controlled by a patented Zenu interface.**

  I. **ZTool™** – Rapid application development and screen design tool.

  II. **ZenuStack** – An information display protocol and methodology for mapping applications and control functions to a Zenu interface.

  III. **XML** – extremely small tags and short data streams designed solely to promote bandwidth efficiency & communicate between the Zenu application and the server.

  IV. **ZPT** – Context-aware predictive text. Nowadays mobile text entry focuses on word-completion after initial letters. There is considerable competition for optimizing this approach, e.g. by minimizing the number of keystrokes necessary to write or select the whole word. Since these word completion techniques have been (and still are) erroneously termed 'word prediction', a misunderstanding of this term has been

established. ZPT is a true prediction in that it suggests words before the user has input anything. ZPT is smart as it not only learns new words entered by the user, but also adapts to the users writing style, which over time leads to a steady increase in overall performance and ease of use in task execution.

V. **ZVR** – "Multi-Voice" recognition capability, specifically designed for the small foot-print of mobile devices but also for laptops and PC's. A method of combining proven speech technology and multiple parallel competing recognition engines that delivers accuracy never before possible with limited voice training requirements.

- **Information Assurance – Mobile**
  Security features can differentiate a product, and satisfy requirements such as FIPS 140-2 and Suite-B compliance. Ultimately the security you require will depend on your application. Zenu extends platform security features by offering standards based SSL, IPSec, or Sensor security technologies. Since the security libraries are provided with a rich API, you add the security features needed for your product. You are secure with Zenu.

- **Application Design** – This factor is straight forward: the more complex the menus and choices, the more time are required to do the job at hand. Building applications with the ZenuSuite enables developers to easily provide mobile users with relevant information, yielding rapid and error-free task execution and data-sharing accurately and quickly. This provides a consistent and highly intuitive user experience.

- **Input Methodology** – Web based content must be designed to fit tiny screens, implying extensive scrolling and two-handed operation. This is an activity that is hard to master – especially without a stylus, let alone using one hand – until now. Zenu eliminates the need for the tiny keypad or stylus, enabling 'thumb to text' entry at rates of up to 40wpm and with an appropriate application/workflow design achieve total hands free voice activated control.

- **Usability** – The results of a usability study (an online consumer banking application) performed by Professor Clifford Nass, head of the Center for the Study of Language and Information, Department of Communications, at Stanford University were striking in their consistency and their clarity. The Zenu interface (and control of the application) was remarkably better than the Wells Fargo interface (Wells Fargo was the #1 voted site for online banking as determined by Jupiter Research) on every metric.

  Specifically:

  - 85% of participants liked the Zenu interface better than the Wells Fargo interface; this is the largest differential in liking I have seen in my 15 years of research.

  - 80.5% of participants found the Zenu interface easier to use, even though they had no experience with the Zenu and very significant experience with traditional Web interfaces.

  - 78% found the Zenu interface to be more engaging and more relaxing than the traditional Web interface.

  The study was to determine a number of usability factors on both mobile devices and PC platforms when compared to Wells Fargo's method of executing the same application. No

instructions or manuals were supplied. The users “got it”. (The full study is available on request).

Ad Hoc Connections – "Zenu Offline” addresses the issue of intermittent connections. Nothing is more frustrating than the loss of a network connection – especially when in the midst of performing a task. When a user will be simply collecting information and the network connection will be intermittent, Zenu has the ability to allow the user to continue their task even without the connection. When the connection has been re-established, the data collected can then be uploaded to the server.

- **Bandwidth** – Limited bandwidth is a primary impediment to the transmission of data across communication networks. ZenuSuite addresses this limitation with its XML data-exchange capability, lowering airtime costs and enhancing situational awareness by enabling rapid, real-time information sharing across austere bandwidth.

- **Power Consumption** – Zenu controlled applications enable rapid information exchange when accessing remote servers. This places less demand on the device and significantly extends battery life.

- **Synchronization** – Information that is not current is like reading yesterday’s newspaper. In order to make informed decisions mobile users need access to current ‘live’ information at any time. Synching is not an option – especially when information sharing is essential to the success of the mission. ZenuSuite obviates the need to synch providing users with an accurate view of their information irrespective of device. You are in-synch with Zenu.

- **Branding and Personalization** – Zenu can be personalized by the user (usually the enterprise owner) to communicate with targeted individuals, delivering their wants and needs, enabling them to perform tasks, share information and interact easily with **little or no training**. Product and brand differentiation is easily achieved with the versatile and flexible built-in customization features, all-the-while providing the user with the consistent control capability that makes Zenu applications so powerful when compared to other methods of interaction. Mobile devices become easier to use, device-capability is expanded, and you get the credit. Your “brand in the hand”.

Server-Side

Zenu is a thin-client browser and a methodology to implement and control workflow. The Zenu was specifically designed to keep the user interface simple for the user to perform tasks.

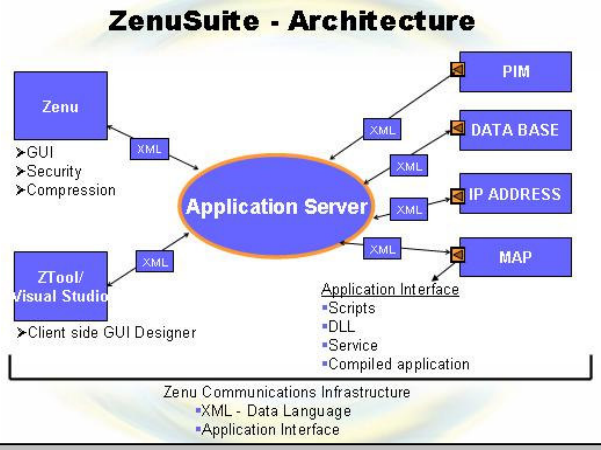
Unbinding the constraints of third party and proprietary client/server architectures Zenu offers application developers a method of efficiently interacting with any data irrespective of where it resides – on your servers. You keep control of your data.

There are no server-side components that are needed to build Zenu applications. The only requirement is that the implementation technology used be capable of communicating to the client device using XML.

This provides developers with the freedom to use their preferred development technology on the server, as long as it is capable of transmitting and receiving XML. The server-side can be implemented using any development technology including middleware. The choice is entirely yours.

Zenu provides users with one common method of control that enables them to perform tasks without needing to know the mechanics of how the device works.

Zenu enables the resources of the device to participate in the application, obviating the need to learn how a particular piece of hardware works. This makes choosing the “best” hardware much easier.



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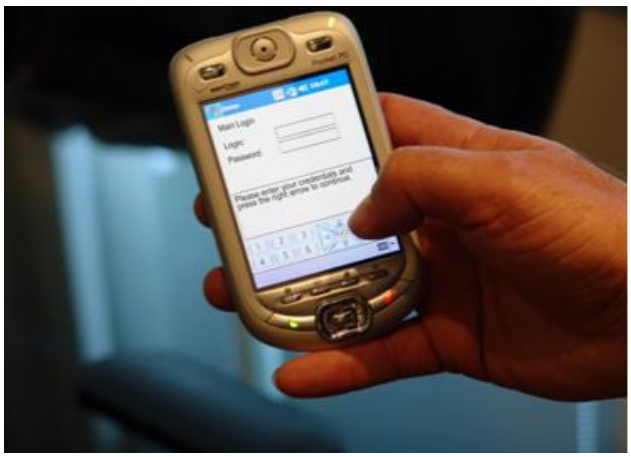
Prototype Demonstrations

To illustrate the functionality of the Zenu interface, ChangeTools has built a number of application demonstrations. These demos were developed using ASP and ASP.NET with C#., but any development language could have been used.

Summary

Recognizing that we are all sorely impatient and that our most precious resource is TIME, the ZenuSuite with its patented methodology, universal portal and server-side management tools enable enterprise and application developers the ability to leverage the Internet to showcase and deliver applications that were formally housed on the desktop to personnel in the field across multiple platforms in a standard highly effective and productive manner.

Zenu is the Benchmark Interface for the Mobile Era ®



No Stylus, No Scrolling – Simple, Single Handed Control

Zenu enables the mobile enterprise by delivering
Real-Time Network Visibility and providing a superior method of

- Search
- Tracking
- Monitoring – Sensor Data
- Transacting
- Communication

For demonstrations, contact:
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ChangeTools Inc. has developed and patented Zenu®, an interface based method for control. The ZenuSuite is a set of tools and conventions that govern the formatting of data for building mobile applications. Designed to simplify the interaction with information, especially for mobile users with usability, connectivity, and command and control features that deliver a seamless user experience across multiple networks and devices, wired or unwired, irrespective of the operating system.

Focusing on mobility and reduced training requirements, ZenuSuite® enables access to server-side data displaying any graphical or web-based application in a consistent and intuitive manner. Particularly suited for transactional tasks undertaken by untrained users where accuracy, information sharing, communication and speed are essential to the success of the enterprise.