INTRODUCTION

For years engineers and computer technicians have looked for a better way for people to communicate with their computers. Keyboards while feeling natural to many of us has advanced very little beyond the typewriters which have been around for well over a hundred years and though the mouse is a step above that it still takes practice for someone who has never used one to become used to the idea of moving the mouse with it and after years of using a computer many older people still have trouble with the concepts of double clicking, right clicking, dragging, dropping and other techniques that can seem simple to more advanced computer users.

Computing is usually defined as the activity of using and developing computer technology, computer hardware and software. It is the computer specific part of information technology.

Surface computing or Microsoft surface (codename : Milan) is a multi-touch product form Microsoft which is developed as a software and hardware combination technology that allows a user are multiple user to manipulate digital content by the use of natural motions, hand gestures, or physical objects.

Microsoft Surface Computer is the first in a new category of surface computing products from Microsoft that will break down traditional barriers between people and technology. It is the next generation of computer interfaces those offer multi touch technology. Unlike most touch screens, surface computer can respond to more than one touch at a time without keyboard or a mouse. The next generation of computer interfaces will be hands on.
Computing curricula 2005 defined computing:

In general way, we can define computing to mean any goal-oriented activity requiring, benefiting from or creating computers. Thus, computing includes designing and building hardware and software system for a wide range of purposes; processing, structuring, and managing various kinds of information; doing scientific studies using computers; making computer systems behave intelligently; creating and using communications and entertainment media; finding and gathering information relevant to any particular purpose, and so on. The list is virtually endless, and the possibilities are vast.

TIME LINE

The technology behind Surface is called multi touch and has at least a 25-year history, beginning in 1982, with pioneering work being done at the University of Toronto (multi-touch tables) and Bell Labs (multi touch screen). The product idea for Surface was initially conceptualized in 2001 by Steven Bathiche of Microsoft Hardware and Andy Wilson of Microsoft Research.

In October 2001, a virtual team was formed with Bathiche and Wilson as key members, to bring the idea to the next stage of development.

In 2003, the team presented the idea to the Microsoft chairman Bill Gates in a group in a group review. Later, the virtual team was expanded and a prototype nicknamed T1 was produced within a month.
The prototype was based on an IKEA Table with a hole cut in the top and a sheet of architect vellum used as a diffuser. The team also developed some applications, including pinball, a photo browser and a video puzzle.

Over the next year, Microsoft built more than 85 early prototypes for Surface. The final hardware design was completed in 2005.

A similar concept was used in the 2002 science fiction movie Minority Report. As noted in the DVD commentary, the director Steven Spielberg stated the concept of the device came from consultation with Microsoft during the making of movie. One of the film’s technology consultant’s associates form MIT later joined Microsoft to work on the Surface project.

Surface was unveiled by Microsoft CEO Steve Ballmer on May 30, 2007 at The Wall Street Journal’s ‘D: All Things Digital’ conference in Carlsbad, California. Surface Computing is part of Microsoft’s Productivity and Extended Consumer Experiences Group, which is within the entertainment and Devices division.

The first few companies to deploy Surface will include Harrah’s Entertainment, Starwood Hotels and Resorts Worldwide, T-Mobile and a distributor, International Game Technology.

On the April 17, 2008 AT&T became the first retail to lunch Surface in June 2008 Harrah’s Entertainment lunched Microsoft Surface at Rio iBar and Disneyland launched it in Tomorrow-land, Innovations Dream Home.

On August 13, 2008 Sheraton Hotels introduced Surface in hotel lobbies at 5 locations.

On September 8, 2008 MSNBC began using the surface to work with election maps for the 2008 US Presidential Election on air. MSNBC’s political director, Chuck Todd, was placed at the helm.
What is surface computer?

The Human Touch

Microsoft Surface puts people in control of their experiences with technology, making everyday tasks entertaining, enjoyable and efficient. Imagine ordering a beverage during a meal with just the tap of a finger. Imagine quickly browsing through music and dragging favorite songs onto a personal playlist by moving a finger across the screen. Imagine creating and sending a personal postcard of vacation pictures instantly to friends and family, while still wearing flip-flops.

Surface also features the ability to recognize physical objects that have identification tags similar to bar codes. This means that when a customer simply sets a wine glass on the surface of a table, a restaurant could provide them with information about the wine they're ordering, pictures of the vineyard it came from and suggested food pairings tailored to that evening's menu. The experience could become completely immersive, letting users access information on the wine-growing region and even look at recommended hotels and plan a trip without leaving the table.

Surface computing at Microsoft is an outgrowth of a collaborative effort between the Microsoft Hardware and Microsoft Research teams, which were struck by the opportunity to create technology that would bridge the physical and virtual worlds. What started as a high-level concept grew into a prototype and evolved to today's market-ready product that will transform the way people shop, dine, entertain and live. It's a major advancement that moves beyond the traditional user interface to a more natural way of interacting with information. Surface computing, which Microsoft has been working on for a number of years, features four key attributes:
Direct interaction. Users can actually “grab” digital information with their hands, interacting with content by touch and gesture, without the use of a mouse or keyboard.

Multi-touch. Surface computing recognizes many points of contact simultaneously, not just from one finger like a typical touch-screen, but up to dozens of items at once.

Multi-user. The horizontal form factor makes it easy for several people to gather around surface computers together, providing a collaborative, face-to-face computing experience.

Object recognition. Users can place physical objects on the surface to trigger different types of digital responses, including the transfer of digital content.
APPLICATIONS DEVELOPMENTS

Microsoft Surface applications can be written in Windows Presentation Foundation or XNA. The development process is much like normal Vista development, but custom WPF can controls had to be created by the Surface team due to the unique interface of Surface. Developers already proficient in WPF can utilize the SDK to write Surface apps for deployments for the large hotels, casinos, and restaurants.

Windows Presentation Foundation:

The windows Presentation Foundation (or WPF) is graphical subsystem for rendering user interfaces in Windows based applications. WPF, initially released as part of .NET Framework 3.0, is another step in Microsoft’s evolving rich client strategy. Designed to remove dependencies on the aging GDI subsystem, WPF is built on DirectX, which provides hardware acceleration and enables modern UI features like transparency, gradients and transforms. WPF provides a consistent programming model for building applications and provides a clear separation between the user interface and the business logic.

WPF also offers a new markup language, known as XAML which is an alternative means for defining UI elements and relationships with other UI elements.[1] A WPF application can be deployed on the desktop or hosted in a web browser. It also enables rich control, design, and development of the visual aspects of Windows programs. It aims to unify a number of application services: user interface, 2D and 3D drawing, fixed and adaptive documents, advanced typography, vector graphics, raster graphics, animation, data binding, audio and video.
WPF is included with Windows 7, Windows Vista and Windows Server 2008, and is also available for Windows XP Service Pack 2 or later, and Windows Server 2003.

Microsoft Silverlight is a web-based subset of WPF that enables Flash-like web and mobile applications with the same programming model as .NET applications. 3D features are not supported, but XPS and vector-based drawing are included.

- WPF provides a sophisticated layout system that handles the arrangement of all visual elements.[5]
- The Layout engine uses a two phase system.
  - First is the measure phase, where every element in the UI tree is queried for its desired size.
  - Second is the layout phase, where each element is instructed as to its actual size and location.
  - This is a recursive process.
- WPF ships with a handful of layout panels (StackPanel, WrapPanel, Canvas, UniformGrid, Grid, DockPanel) with each panel specializing in a particular type of layout.
- WPF also provides a transformation engine.
  - All transforms in WPF are eventually turned into Direct3D instructions which then become native GPU TRANSFORM instructions.
  - WPF exposes a number of Transform classes (Matrix, Rotation, Scale, Translate, Skew).
- All graphics, including desktop items like windows, are based on Direct3D.
  - This aims to provide a unified avenue for displaying graphics and is the enabling factor that allows 2D, 3D, media and animation to be combined in a single window.
• Allows more advanced graphical features when compared to Windows Forms and its GDI underpinnings.

• Routing the graphics through Direct3D allows Windows to offload some graphics tasks to the GPU found on the computer's graphics card. This can reduce the workload on the computer's CPU. Since GPUs are fast, parallel pixel processors this also tends to speed up screen refreshes.

• Supports vector-based graphics, which allow lossless scaling.

• Supports 3D model rendering and interaction in 2D applications.

• Interactive 2D content can be overlaid on 3D surfaces, natively.

**XNA**

Microsoft XNA (XNA's not Acronymed) is a set of tools with a managed runtime environment provided by Microsoft that facilitates computer game development and management. XNA attempts to free game developers from writing “repetitive boilerplate code and bring different aspects of game production into a single system.

XNA currently encompasses Microsoft's entire game development sections including the standard Xbox Development Kit and XNA game studio.

The XNA framework is based on the native implementation of .NET Compact Framework 2.0 for the Xbox 360 development and .NET Framework 2.0 on windows. It includes an extensive set of class libraries, specific to game development, to promote maximum code reuse across target platforms. The framework runs on a version of the common language runtime that is optimized for gaming to provide a managed execution environment. The runtime is available for windows XP, windows vista, and Xbox 360. Since XNA games are written for the runtime, they can run on any platform that supports the XNA framework and minimal or no modification games that run on the framework can technically be written in any .net compliant language, but only C# and XNA game studio express IDE and all version of visual studio 2005 are officially supported.

XNA Framework thus encapsulates low-level technological details involved in coding a game, making sure that the framework itself takes care of the difference between Information Technology and Engineering
platforms when games are ported from one compatible platform to another, and thereby allowing game developers to focus more on the content and gaming experience. The XNA Framework integrates with a number of tools, such as the Cross-platform Audio Creation Tool (XACT), to aid in content creation. The XNA Framework provides support for both 2D and 3D game creation and allows use of the Xbox 360 controllers and vibrations. XNA framework games that target the Xbox platform can currently only be distributed to members of the Microsoft XNA creators.

XNA Build is a set of game asset pipeline management tools, which help by defining, maintaining, debugging, and optimizing the game asset pipeline of individual game development efforts. A game asset pipeline describes the process by which game content, such as textures and 3D models, are modified to a form suitable for use by the gaming engine. XNA Build helps identify the pipeline dependencies, and also provides API access to enable further processing of the dependency data. The dependency data can be analyzed to help reduce the size of a game by finding content that is not actually used. For example, XNA Build analysis revealed that 40% of the textures that shipped with MechCommander 2 were unused and could have been omitted.

WHAT SURFACE CAN DO?

For years engineers and computer technicians have looked for a better way for people to communicate with their computers. Keyboards while feeling natural to many of us has advanced very little beyond the typewriters which have been around for well over a hundred years and though the mouse is a step above that it still takes practice for someone who has never used one to become used to the idea of moving the mouse with it and after years of using a computer many older people still have trouble with the concepts of double clicking, right clicking, dragging, dropping and other techniques that can seem simple to more advanced computer users.
What makes it Unique?

**Direct Interaction:**
The ability to "grab" digital information with hands - interacting with touch/gesture, not with a mouse or keyboard.

**Multi-Touch:**
The ability to recognize multiple points of contact at the same time, not just one (Ex. One finger, like with most touch screens), but dozens.

**Multi-User:**
The Surface’s screen is horizontal, allowing many people to come together around it and experience a “collaborative, face–to–face computing experience”.

**Object Recognition:**
Physical objects can be placed on the Surface’s screen to “trigger different types of digital responses” (Ex. cell phones, cameras, & glasses of wine).