

[0092] MLD units can be used to present various different types of display elements on two or more display layers which are stacked or sandwiched or spacially displaced from one another.

[0093] The present invention may facilitate a transfer of display elements between the layers of a single multi-layer display. However it will be appreciated that the present invention may be used to transfer display elements over a series of monitors or displays, both single layer and/or multi-layer, driven from a single output device such as a computer system. The device used to drive the MLD system may be a computer system, but it should be appreciated that other types of output devices and associated hardware may also be used in conjunction with the present invention.

[0094] Preferably the present invention may be adapted to provide a user interface which allows a user of a multi-layer display system to adjust the positioning or visual properties or organisation of display content presented by at least one multi-layer display. Such a user interface system may allow a user of the display or displays involved to fully customize how display content of interest is displayed with respect to the plurality of display layers available to them.

[0095] The present invention may be implemented through software code or computer based instructions loaded into a programmable logic device such as a computer system or microprocessor. The method of operation or steps executed by such software, in addition to the apparatus or system provided through physical hardware controlled by such software are also within the ambit of the present invention.

[0096] Alternatively, the present invention may be completely electrically "hard-wired" in hardware wherein input display elements are allocated to display layers according to a pre-assigned allocation regime. Furthermore, the present invention may receive input information relating to the positioning or ordering of display elements on a display adapter from hardware associated with the computer system. For example, the "Z-buffer" which is the section of memory in a video card which keeps track of which display elements can be viewed and which display elements are hidden behind other display elements, may be accessed by the present invention.

[0097] Preferably, a user interface implemented in conjunction with the present invention may have a number of different configurations depending on the particular application it is to be used with. For example, the software code or process implemented may form an operating system process, or can be run as a background service on the computer system driving the MLD unit or units involved.

[0098] The present invention may be adapted to facilitate the assignment or allocation of a display point or points (that is, a "display element") present within a wide variety of different types of display elements to a layer or layers of a multi-layer display system (that is, a display system incorporating at least one MLD and optionally other MLD and/or SLD units). The invention may be used, for example, to assign a display point or element on an SLD to a display layer on an MLD or vice-versa, or to assign a display point or element on a display layer of an initial MLD to a destination layer on that MLD or to a destination layer on another MLD. Alternatively, the invention may be used to

assign a new display point or element which is yet to be displayed on any display layer to a display layer in the multi-layer display system.

[0099] The display elements can take many different forms, from for example, the various windows available under a graphical user interface for computer systems, to user input pointers such as mouse cursors, through to in some instances, components of the user interface of a computer operating system that displays information using the MLD involved. Furthermore, display elements present or embedded within Computer Aided Design (CAD) systems or photographic or video media may also be transferred using the present invention.

[0100] A user driven and controlled transfer of GUI (Graphical User Interface)-based windows, individual images, cursors, text pointers and/or other alternative forms of display elements in conjunction with the present invention may provide significant advantages to users of multi-layer displays. This allows the content of display elements to be organised and displayed across multiple layers for the effective communication of the information content involved to the user or observer of the display. Furthermore, the information involved may also be structured or organised to the benefit of a user across multiple layers to assist in analytical investigations of data or information.

[0101] The at least one display element selection identifier may be generated from or obtained by a user of the display interacting with or issuing commands to the computer system which uses the current MLD to present display elements. These types of element selection actions executed by users of the display can provide a trigger signal and also identity information with respect to a particular display element, such as a window or mouse pointer for example, being selected for a transfer between layers by the user.

[0102] The present invention may also incorporate one or more graphical user interface display control components which allow such element selection actions by a user to be captured, to in turn generate a display element selection identifier. For example, in one preferred embodiment the present invention may encompass the provision of a control component in the form of a toolbar type interface. This toolbar component may provide a number of icons, buttons, pull-down menus and other similar interface components to allow a user to select and identify a particular display element or window for transfer to an alternate layer and/or to alter its visual properties. A user's interaction with a control component can then constitute an element selection action. In response to such element selection actions, these types of control components may in turn generate or supply the display element selection identifier to further components of the present invention which facilitate the actual transfer of the display element involved to an alternate layer.

[0103] A single element selection action may in turn trigger the generation of a single display element selection identifier only. A single action may identify a single element for transfer in such embodiments. However, those skilled in the art should appreciate that other implementations of the present invention where groups of related display elements or windows may all be identified through a single element selection action are also envisioned.

[0104] The present invention may also employ or use at least one display layer selection identifier which is generated