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## APPARATUS AND METHOD FOR PROVIDING AN ADAPTIVELY RESPONSIVE FLEXIBLE DISPLAY DEVICE

### FIELD OF INVENTION

The present invention relates to an apparatus and method to communicate multimedia documents or content to a mobile or fixed device over a wireless network. In particular, the mobile or fixed device may be configured as a digital periodical or advertising device to transmit and receive converted multimedia documents or content delivered using multimedia messaging service over a wireless network.

### BACKGROUND

Wireless communications has enabled widespread easy access to mass media and multimedia information via mobile devices, cellular phones, personal digital assistants, smart phones, or the like. Although the availability of multimedia information is ubiquitous, proper viewing, display, and delivery of information for an enjoyable user experience is still lacking. This is especially the case for viewing periodicals such as online magazines or news content on a mobile device where a large display is desirable. Moreover, having complex software and hardware is required to receive and display multimedia periodical information on present mobile devices making them expensive, heavy, and power intensive.

Digital fixed advertising display systems are commonplace in urban environments. However, widespread use of these systems is not commonplace since they require a fixed power source and wired network connection. This is problematic for rural and remote locations such as highways and light or utility posts where access to power and communications infrastructure is limited. Moreover, digital advertising systems do not provide any interactivity, location awareness, or accessibility to Internet content making them poor for creating impressions on consumers and constraining their effectiveness.

Organic light emitting diode (OLED), liquid crystal display (LCD) flexible device technology, and other flexible substrate technologies have made advancements recently promising to provide an enhanced user experience, larger display sizes, portability, and low power consumption. However, commercialization of products having flexible displays has been slow due to a lack of viable and robust consumer applications. Moreover, another problem with devices having flexible displays is the ability to integrate other electronic circuitry due to form factor constraints and poor design.

Multimedia messaging service (MMS) is a standardized technology being developed by the third generation partnership project (3GPP), the third generation partnership project 2 (3GPP2), and the open mobile alliance (OMA). Although originally developed to send photos and simple video clips, recently added features to MMS have expanded its capabilities. The added features to MMS have made it into the preferable transport and presentation mechanism of mobile messaging that rivals electronic mail. However, the commercial applications and utilization of advanced MMS features has been limited. It is desirable to provide a digital periodical or advertising device preferably having a flexible display for receiving diverse mass media information, multimedia information, or Internet content in an efficient manner using MMS.

### SUMMARY

An apparatus and method for delivering mass media and multimedia information to a digital periodical or advertising

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device preferably using multimedia messaging service (MMS) and having an electronic flexible screen or display is disclosed. A multimedia document, part of a multimedia document, web page, multimedia advertisement, or any other multimedia content on a server or a computer is extracted, parsed, and/or segmented into a plurality of video, audio, image, or text elements. The plurality of elements are each converted to an MMS message and transmitted optionally with an MMS assembler message or embedded information in each MMS message for proper reassembly of the original multimedia document or content. The MMS messages are received and reassembled back into the original multimedia document or content at a digital periodical or advertising device.

### BRIEF DESCRIPTION OF THE DRAWINGS

A more detailed understanding of the invention may be had from the following description, given by way of details and to be understood in conjunction with the accompanying drawings wherein:

FIG. 1 is a diagram of a digital periodical or advertising device in accordance with an embodiment of the present invention;

FIG. 2 is a diagram of a digital periodical or advertising device having an electronic flexible screen or display in accordance with another embodiment of the present invention;

FIG. 3 is a diagram of a system for providing and communicating mass media documents, multimedia documents, or any multimedia content in accordance with another embodiment of the present invention;

FIG. 4 is a diagram of a method for providing converted mass media documents, multimedia documents, or any multimedia content using multimedia messaging service (MMS) in accordance with another embodiment of the present invention; and

FIG. 5 is a diagram of communicating converted mass media, multimedia documents, or any multimedia content using a plurality of MMS messages in accordance with another embodiment of the present invention.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention will be described with reference to the drawing figures wherein like numerals represent like elements throughout. FIG. 1 is a diagram of a digital periodical or advertising device **100** for mobile or fixed applications. Mobile applications include a digital newspaper, magazine, brochure or any other digital mass media medium or apparatus. Fixed applications include a digital billboard, flyer or any other advertising medium or apparatus.

Device **100** comprises computer bus **140** that couples one or more processors **102**, interface controller **104**, memory **106** having software **108**, storage device **110**, power source **112**, display controller **120**, one or more displays **122**, such as flexible organic light emitting diode (OLED) electronic displays, input/output (I/O) controller **116**, I/O devices **118**, GPS device **114**, one or more network adapters **128**, and one or more antennas **130**. Device **100** may optionally have one or more motion, light, heat, radio frequency identification (RFID), face recognition, shape, or voice recognition sensors **126** and touch detector **124** for detecting any touch inputs, including multi-touch inputs, for one or more displays **122**. Interface controller **104** communicates with touch detector **124** and I/O controller **116** for determining user inputs to