Lin-shan Lee, Berlin Chen, “Spoken Document Understanding and Organization”, IEEE Signal Processing Magazine, Special Issue on Speech Technology in Human-machine Communication, Vol. 22, No.5, Sept. 2005, pp.42-60.

This is one of 9 papers selected by the special issue on speech technology. Usually there is only one such special issue in a few years. This is a review paper presenting the new framework for easier browsing the retrieved speech information, including a prototype system developed at Taiwan University with functionalities first seen in the world at the time of publication.

Because speech information are signals different from text, it cannot be displayed on the screen for browsing. This paper presents a framework of technologies to handle this problem. Figure 9 of p.55 is an example using the broadcast news browser prototype system developed at Taiwan University to present this framework. When the user clicks “International Political News (國外政治)” in (a) at the upper left corner, the computer shows the topic map for international political news in (b) at the upper right corner, where every block is a group of news stories with similar topic (obtained automatically), labeled by a set of automatically extracted key terms to indicate the topic (e.g. “以色列(Israel)、阿拉法特(Arafat)、巴勒斯坦(Palestine)、迦薩市(Gaza City)”). When the user further clicks this block, a map for finer sub-topics for this group of news stories on the lower level is shown as at the lower right part (c). If the user now clicks the block at the upper middle (labeled by “阿拉法特(Arafat), 阿巴斯,雷馬拉, 任命(Appointment)”), the 5 news stories under this sub-topic are shown by the automatically generated titles as at the lower left corner (d). The user can then choose to listen to the complete news stories, or only the automatically generated summaries.

本期刊物為全面探討語音技術之專刊共包括9篇論文，每隔幾年才會有一本這樣的專刊。本文為回顧性論文(review paper),討論有助瀏覽被搜尋到的語音資訊的新架構，並描述台大的實驗系統，其功能為當時全球所僅見。

因為語音資訊只是一堆訊號，不同於文字，不易呈現在螢幕上供人瀏覽點選，本文介紹了一整套技術架構來克服這個難題。第55頁的圖9用台大的廣播新聞瀏覽實驗系統為例來說明。當使用者點選左上角(a)中的「國外政治」(這是自動分類出來的)，電腦會呈現右上角(b)中的國外政治新聞的主題地圖，圖中的每一方塊都是一群主題相近(自動分析出來的)的新聞，並以自動抽取的關鍵詞標示來說明該群新聞的主題(例如右上角的「以色列、阿拉法特、巴勒斯坦、迦薩市」)。使用者如點選該方塊，電腦會呈現將該群新聞進一步分成更細的次主題的下一層主題地圖，如右下角的(c)。此時使用者如點選上方中央的方塊(由「阿拉法特、阿巴斯、雷馬拉、任命」等關鍵詞標示)，電腦就會呈現此一次主題中的5則新聞如左下角的(d)，每則新聞以自動產生的標題呈現，使用者可以點選聆聽全文，或只聽自動產生的摘要。