



國立高雄應用科技大學
企業管理系碩士班
碩士論文

應用資料探勘技術建立顧客流失預測模型
-以行動通訊產業為例

The Application of Data Mining Technology for Building Customer
Churn Predict Model in Mobile Telecommunication Industry

研究生：郭承林

指導教授：葉惠忠 博士

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應用資料探勘技術建立顧客流失預測模型 -以行動通訊產業為例

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摘要

隨著資訊和通訊科技的快速發展和普及化，行動通訊科技以變成生活中溝通與傳輸的重要媒介，也間接促成電信業者間的競爭。對於許多企業而言，在面對激烈的競爭下，將顧客流失率降至最低為企業首要面對問題之一。

本研究主要藉由問卷發放取得電信產業中，顧客基本資料、顧客行動電話使用經驗和滿意度資料，透過資料探勘之相關技術，包含決策樹和判別分析，在顧客流失機率分為高低和高中低兩類之情況下，進行顧客流失預測，希望找出不同流失機率顧客群的特性，提供企業對於降低顧客流失可行方法之參考基礎。

經由實證結果可以得知，顧客基本資料對於顧客流失之預測能力偏低，顧客行動電話使用經驗和顧客滿意度對於顧客流失有一定之預測能力。希望藉由本研究結果提供電信業者顧客流失的相關行為，強化鞏固低度流失顧客群，避免成為中高度流失顧客群，降低企業損失。

關鍵字：行動通訊、資料探勘、顧客流失、顧客滿意度

第一章 緒論

第一節 研究背景與動機

隨著資訊和通訊科技的快速發展和普及化，行動通訊(Mobile telecommunication)科技已經快速發展並且應用於生活中，成為溝通和傳輸的重要工具和媒介。從 1990 年開始，行動通訊才真正逐漸發展，並且成為工業化國家發展的重要關鍵因素，其最主要的原因就是行動通訊是不受地理區域和空間的限制，能夠有效廣泛應用在商業活動和日常生活，讓訊息傳播更加方便。

我國電信市場主要於 1997 年由交通部電信總局首開行動電話行動通訊業務，使得國內行動電話通信進入完全競爭市場的局面。根據國家傳播通訊委員會 (2011)統計顯示，國內電信服務業中以行動通訊的總營收最多，占整體營收的 58.63%，由此看來，無線通訊產業的市場商機利益龐大，這也使得無線通訊相關業者爭相投入大量資金和資源，期望能從中獲取大量利益。因為市場具有高度獲利性，使得各家業者各自推出不同的費率方案和促銷組合，期望能吸引顧客簽約，增加市占率和獲利率；再加上各項服務的申辦方便性提高和手續費降低，以及近幾年來新發展的行動號碼可攜帶性服務的提出，大大降低顧客的轉換障礙 (Maicas, Polo & Sese, 2009)，如此一來顧客便能輕易的在不同的服務提供者之間轉移，增加行動通訊業的顧客流失率(Customer churn rate)。

對於許多企業而言，面對競爭激烈的市場和商業環境，顧客流失管理成為企業關心的首要問題，唯有透過滿足顧客的需要，才可以將顧客流失率降至最低。Berson et al., (2000)提出，行動通訊產業每個月的顧客流失率

平均為 2.2%；Mattersion (2001)調查顯示，在電信產業中，歐洲每年顧客流失率為 25%、美國為 37%、亞洲為 48%；英國 GeoConnexin (2008)調查指出，德國的行動通訊產業 2008 年顧客流失率為 38.6%。從上述可以看出各國電信業者都面臨嚴重顧客大量流失的問題，公司若能減少顧客流失率，就能大大的減少吸引新顧客的成本，並且增加顧客獲利率。根據 Berson et al., (2000)研究顯示，電信產業中獲取一位新顧客的成本約為美金 300~600 元。Kotler (1994)也指出，若能有效的保留現有的顧客，其獲利率是吸引新顧客的十六倍。故企業必須設法提高顧客保留率並且降低顧客流失率，以增加企業獲利。

企業為了在競爭激烈的環境中生存並獲利，推出了許多吸引顧客的優惠方案，包含了網內互打免費、零元手機方案、續約購機補貼等，企圖利用此類優惠方案吸引新顧客，但往往忽略現有顧客，導致以往企業大多會針對已流失的顧客進行事後抽樣，並且針對流失的顧客背景、交易記錄和消費行為分析其流失前的行為，但面臨顧客快速流失的情況下，事後的分析往往已經失去時效性。

先前研究主要都利用轉換成本、顧客滿意度、顧客信任、服務品質、預期價值、忠誠度和顧客信任來檢驗對於顧客流失的影響(Gerpott, Rams & Schindler, 2001; Ranaweera & Prabhu, 2003; Kim, Park & Jeong, 2004; Ahn, Han & Lee, 2006)，此類因素皆是顧客使用企業提供產品/服務所產生的主觀認知而呈現出來的結果，故較難掌握。一般而言，顧客的流失行為會顯示在其結束合約之前的產品使用度上，以電信產業來說，主要可以透過顧客的通話習性了解，主要包含平均通話時間、平均通話次數、通話對象等來了解，若是可以透過相關的分析工具針對流失顧客結束合約之前的相關使用變數產生的徵兆，用來預測顧客的流失行為，提供給電信業者加以運

用，則可以避免顧客流失的行為產生，降低顧客流失所帶來的損失。

最常用的分析工具為資料探勘(Data-mining)。資料探勘為發現顯著顧客資訊的一系列程序，最主要的目的是可以藉由分析大量資料，挖掘隱蔽但有用的相關知識和資訊，進而解決企業所面臨的營運問題。

故本研究希望透過資料探勘的方式，針對不同的消費者基本資料、行動電話使用經驗和顧客滿意度進行流失行為之預測，提供實證上的結果，給予企業作為決策時的參考依據。

第二節 研究對象與範圍

本研究係針對高雄應用科技大學夜間部學生及它所高雄大專生進行問卷調查，以便利抽樣方式進行本研究問卷發放。主要調查行動通訊使用者的行動電話使用經驗、滿意度和顧客基本資料，提供本研究顧客流失預測使用。

第三節 研究目的

本研究希望可以藉由問卷調查的方式，取得電信產業中顧客使用行動通訊產品相關經驗資料、滿意度和顧客基本資料的調查，藉由此類資料找出影響顧客流失的相關因素，並預測其流失的行為。故本研究的研究目的如下：

1. 將顧客基本資料，分別透過資料探勘方法，預測顧客流失的行為。透過此一方法了解顧客的基本資料是否可以有效作為預測顧客流失行為的工具，提供企業有效預測顧客流失行為。
2. 將顧客的行動通訊使用變數，分別透過資料探勘方法，預測顧客

流失的行為。透過此一方法了解顧客行動通訊使用經驗是否可以作為預測顧客流失行為的預測變數，提供企業有效預測顧客流失行為。

3. 將顧客對於目前使用門號公司之滿意度變數，分別透過資料探勘方法，預測顧客流失的行為。透過此一方法了解顧客滿意度是否可以作為預測顧客流失行為的預測變數，提供企業有效預測顧客流失行為。

結合顧客對於目前使用門號公司之滿意度加入行動通訊使用變數，分別透過資料探勘方法，進一步了解行為變數和態度變數對於預測顧客流失行為有無更佳之預測效果，提供企業有效預測顧客流失行為。

The Application of Data Mining Technology for Building Customer Churn Predict Model in Mobile Telecommunication Industry

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ABSTRACT

With the rapid development and popularization of information and communications technology, mobile communications technology has become an important medium of communication and transmission in our life. It's also indirectly contributed the competition of mobile communications. Under the fierce competition, minimizing customer churn rate has become the first problem that enterprises have to face.

This study used questionnaire to obtain customer information, customer mobile phone experiences and satisfaction data, and through data mining technology, including decision trees and discriminant analysis to predict customer churn, and want to find out the different features to reduce customer churn.

From our empirical results can we know that the customer churn prediction ability of customer information is low than mobile phone experience and satisfaction. By the results of this study, we hope to provide the behavior that is relevant to customer churn of telecommunication industry to reduce the loss by strengthening the customer with low customer churn, to avoid becoming medium or high.

Keywords: Mobile Telecommunication 、 Data Mining 、 Customer Churn 、 Customer Satisfaction

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