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Book Review: Mobile Search Behavior: An In-depth Analysis Based on Contexts, APPs, and Devices. By Dan Wu and Shaobo Liang. In: Gary Marchionini (Ed), *Synthesis Lectures on Information Concepts, Retrieval, and Services*. Morgan & Claypool Publishers, 2018.

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These Times They Are A-Changin'. During 2015 Google reported that for the first time, more search queries were made on mobile devices than on desktop computers. By 2018, some estimates were indicating over 60% of the world's population possess a Smartphone. Voice search has been reported as accounting for 20% of all search queries made on mobile devices with predictions it may account for half over the next few years. Understanding mobile search behaviours is therefore of significant interest both academically and commercially.

This book aims to provide further understanding of search behaviour on mobile devices, as people act through not only web browsers, but also specialist mobile apps, transition between those apps and also transition across devices. According to the authors the book addresses a number of perceived gaps in the mobile search behaviour literature. These include understanding mobile search behaviours from the perspective of user sessions, with tendencies for the current literature to focus on analysing patterns as a whole in large aggregated search logs of single search engines, rather than by individual sessions and multiple apps. The book also premises the increased importance of specialist search apps over and above traditional web browsers.

The authors Dan Wu and Shaobo Liang are at the School of Information Management at Wuhan University in China. The book covers and builds on their existing published research from 2015-2016 in the area of mobile search behaviours.

The book consists of four main sections. Firstly, an extensive review of the existing academic literature on mobile search behaviours but also dipping into 'traditional' Information Science search behaviour research garnered from the desktop computer environment and search evaluation literature from the Information Retrieval (IR) discipline.

The second section covers methodology of two empirical experiments conducted by the authors. The first experiment recreates a 'natural setting' to understand mobile search behaviour in real life through user sessions. For this study 30 students (expert mobile searchers) were recruited from a Chinese university and during 15 days, all their search activity (regardless of which app they used) was tracked by a logging application on their phone. The participants completed structured daily diaries describing their emotions and motivations for the searches made that day and results were further discussed in follow up interviews to investigate factors and causes of the behavioural characteristics.

The second experiment was a controlled user study in a laboratory environment to analyse cross-device behaviour between desktop and mobile devices. In this study 34 students from Chinese universities were recruited. Search task design was informed by the previous experiment including those related to movies, drama, music and language. These tasks were deemed to be unachievable using a single device. For each search task the participant was given 20 minutes on one device (such as a desktop computer), with a gap of 20 minutes and then another 20 minutes on another device (such as a smartphone). Transitions from desktop-mobile and from mobile-desktop were analysed and features such as Click-through analysed for predicting behaviour through machine learning.

The third section discusses the findings from each of the experiments in significant detail with tables and charts, including descriptive statistics, correlations between factors, themes emerging from

qualitative analysis and results of predictive classifiers for device transition search performance. The final section discusses the study results to the existing literature, limitations and conclusions.

The great strength of this book is its wide multi-disciplinary appeal, serving as an extremely useful reference and stimulator for further research questions on mobile search behaviours. It is packed full of detailed empirical findings, relevant to many disciplines. The studies described in the book offer novel approaches towards data collection focusing on search behaviour and transition across multiple apps and devices. This makes a significant contribution to the mobile search behaviour discourse in areas where there is little other published work. Summaries after each chapter recap the main points and help the reader digest the content presented.

In terms of weaknesses, there is a tendency for description, rather than critical evaluation in both the literature review and findings. For example, an interesting mobile search behaviour model is presented from the research, but no comparison is made to the other existing search behaviour models in the literature. The book sometimes feels like the presentation of a series of discrete research questions in the same subject area, lacking a bigger holistic assessment of the whole. The study did not include voice mobile search behaviour which was not picked up by the tracking app. Given current trends, this is a significant limitation of the book given its scope and title.

The Information Scientist will be particularly interested in how social context, time and place influences mobile search needs, motivations (such as curiosity, time-killing, life service and learning) and behaviours. The mobile app designer will be particularly interested in how mobile search query formulation differs from the traditional desktop. Specifically, how intents are related to both app and device transition for search sessions and the follow-up actions to mobile search sessions such as making a purchase and sharing information. The study finding that for some categories of search task, such as finance, participants preferred the web browser to speciality apps, may provide opportunities for app improvements. Those involved in the IR discipline will likely find the 1,000 context aware mobile search tasks developed by the authors useful to incorporate within their studies.

The authors should be commended for their ambitious scope of research questions and mixed-methods design. For those interested in mobile search behaviours, this is a book to add to your reading list in a fast paced area of information science and technology where, *The order is Rapidly fading*.