# Information and communication technology in the real estate industry: productivity, industry structure and market efficiency

Max Kummerow[a,*], Joëlle Chan Lun[b]

[a]*Runstad Center for Real Estate Studies, Department of Urban Design & Planning, University of Washington, Box 355740, Seattle, Washington 98195-5740, USA*
[b]*Department of Property Studies, Curtin University*

## Abstract

This survey of changes in the real estate industry due to information and communication technology (ICT) covers three areas: (a) A brief survey of ICT applications in the property industry, (b) speculation about implications for market structure and productivity within the real estate industry, and (c) comments on the wider macroeconomic implications of these changes. Improvements in information and productivity may lead to important long-run changes in business processes and industry structure tending to favour larger firms and promoting specialization of functions. Changing the information structure of real estate decision systems could change system dynamics and improve allocative efficiency. On the other hand, under different institutional arrangements, better information could increase the amplitude of real estate cycles and destabilize economies.
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Ten years ago I was begging for information, today I'm begging for mercy from too much information (Glenn Mueller, Legg Mason, Inc. and John Hopkins University).

This is all about doing what we have always done—just doing it faster or cheaper (Mike Miles, Guggenheim Fund and editor of *Real Estate Finance*).

*Corresponding author.

*E-mail addresses:* kummerow@u.washington.edu (M. Kummerow), chanlunj@cbs.curtin.edu.au (J. Chan Lun).

## 1. Introduction

Real estate and construction are important sectors in the economy, employing large amounts of capital and significant proportions of the workforce. Costs of accommodation are a major budget item for households and businesses and the built environment influences quality of life and productivity. This paper surveys information and communications technology (ICT) impacts on real estate industry work processes in three areas: (a) An anecdotal survey of successful ICT applications in the property industry (and two failures), (b) speculation about implications for market structure, services quality and productivity within the real estate industry, and (c) comments on the wider macroeconomic context of these changes, especially implications for real estate cycles. The paper begins with a brief overview of the real estate industry.

## 2. Brief overview of the real estate industry

Roles of real estate firms include:

*Agency (brokerage)*—bringing together buyers and sellers (sales and leasing)
*Property management*—marketing, managing physical plant, tenant relations and accounting
*Valuation and research*—estimating current market values of properties (for finance, purchase, sales and taxation) and acquiring and analyzing information on property markets
*Funds management/investment*—listed trusts, wholesale funds and syndication
*Development, design, construction and land use planning*—creating new real estate assets
*Corporate and public sector real estate*—facilities management to provide effective and efficient places to do business or provide public services.

The real estate industry has always been an 'information business' with high transaction costs and considerable inefficiency due to the difficulties in assessing what to do in markets where assets are heterogeneous and trading infrequent. (Smullyan, 1994) Even estimating current market prices presents serious difficulties. Many characteristics of properties, neighbourhoods, occupants, surroundings, public services (e.g., schools and police protection) transactions (was a broker involved and time on the market) and finance (e.g., interest rates, investment expectations) can affect prices. An extensive literature on determinants of house prices reports hundreds of significant price predictor variables.[1] Combining this complexity with the fact that most properties are sold only once or twice a decade makes estimating prices difficult. Results at a particular site depend on 'linkages' or costs of transporting goods, people or information to other sites, the mix of relevant off-site activities varying between enterprises. Offsite influences determine appropriate land use and property values. Patterns of nearby investment and externalities such as noise, air pollution, traffic congestion, views of a river, proximity to a beach and so on, all need to be taken into account by markets and urban planners.

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[1]Main sources for hedonic price models papers are *Real Estate Economics, Journal of Real Estate Research* and *Journal of Urban Economics.* However, hedonic papers have appeared in a wide variety of economics, finance and real estate journals.