World Academy of Science, Engineering and Technology
International Journal of Industrial and Systems Engineering
Vol:10, No:01, 2016

Estimating Knowledge Flow Patterns of Business Method Patents with a Hidden Markov Model

Authors : Yoonjung An, Yongtae Park

Abstract : Knowledge flows are a critical source of faster technological progress and stouter economic growth. Knowledge flows have been accelerated dramatically with the establishment of a patent system in which each patent is required by law to disclose sufficient technical information for the invention to be recreated. Patent analysis, thus, has been widely used to help investigate technological knowledge flows. However, the existing research is limited in terms of both subject and approach. Particularly, in most of the previous studies, business method (BM) patents were not covered although they are important drivers of knowledge flows as other patents. In addition, these studies usually focus on the static analysis of knowledge flows. Some use approaches that incorporate the time dimension, yet they still fail to trace a true dynamic process of knowledge flows. Therefore, we investigate dynamic patterns of knowledge flows driven by BM patents using a Hidden Markov Model (HMM). An HMM is a popular statistical tool for modeling a wide range of time series data, with no general theoretical limit in regard to statistical pattern classification. Accordingly, it enables characterizing knowledge patterns that may differ by patent, sector, country and so on. We run the model in sets of backward citations and forward citations to compare the patterns of knowledge utilization and knowledge dissemination.

Keywords : business method patents, dynamic pattern, Hidden-Markov Model, knowledge flow
Conference Title : ICBIE 2016 : International Conference on Business and Industrial Engineering
Conference Location : Paris, France
Conference Dates : January 21-22, 2016

Open Science Index, Industrial and Systems Engineering Vol:10, No:01, 2016 publications.waset.org/abstracts/40872.pdf