R Data Science for Technology Management

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Abstract : Technology management (TM) is important issue in a company improving the competitiveness. Among many activities of TM, technology analysis (TA) is important factor, because most decisions for management of technology are decided by the results of TA. TA is to analyze the developed results of target technology using statistics or Delphi. TA based on Delphi is depended on the experts' domain knowledge, in comparison, TA by statistics and machine learning algorithms use objective data such as patent or paper instead of the experts' knowledge. Many quantitative TA methods based on statistics and machine learning have been studied, and these have been used for technology forecasting, technological innovation, and management of technology. They applied diverse computing tools and many analytical methods case by case. It is not easy to select the suitable software and statistical method for given TA work. So, in this paper, we propose a methodology for quantitative TA using statistical computing software called R and data science to construct a general framework of TA. From the result of case study, we also show how our methodology is applied to real field. This research contributes to R&D planning and technology valuation in TM areas.

Keywords : technology management, R system, R data science, statistics, machine learning

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