

Formulating a Transformative Research Strategy for Technology Mining in the STI Environment

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Maps are a useful metaphor for formulating research strategies. Each area of research can be considered an island. A discovery is analogous to turning on a flashlight. One can aim the flashlight in the center of an island (thereby attracting the attention of the local inhabitants), in the spaces between the island (thereby attracting very little attention), or on an undiscovered bridge between two islands (thereby attracting the attention of people from both islands to the bridge).

This is the fundamental metaphor for current research on predicting citation rates and identifying emerging trends in science. The scientific literature is clustered in order to identify the islands. New publications that don't link to any established document cluster receive few citations. New publications that are central to a document cluster will receive citations. New publications that can shine a light on a bridge between multiple islands receive the most number of citations.

In this study, we develop this framework further and provide a case example of formulating a transformative research strategy. We have selected, as the context, the research environment of the 'science and technology indicator' domain. A network map of this domain is provided. Sub-networks (closely linked islands) are identified. Two technology mining 'islands' are located in this network. Links to neighboring islands within a sub-network are defined as evolutionary links (i.e. less likely to result in transformative research). Links to distant islands in neighboring sub-networks are defined as transformative. Implications for a model of transformative research are provided.