

Technology Frames: a fourth organisational capability?

VIRGINIA ACHA

Final Year Doctoral Student, SPRU, University of Sussex
Research Officer, Centre for Complex Product Systems (CoPS)

G N VON TUNZELMANN

Professor of the Economics of Science and Technology
Director of Research, SPRU, University of Sussex

*Paper presented at the Nelson and Winter Conference
in Aalborg, Denmark June 12-15 2001, organised by DRUID*

ABSTRACT

In this article, we introduce the concept of the technology frame, which is the firm's self-image of its technological resources, capabilities and opportunities. It is the conceptualisation by which the firm's top managers not only identify and understand these, but by which they assign them worth within a wider corporate strategy. In our analysis, we consider how the frame can influence – and be influenced by – patterns in the firm's technology inputs, outputs and ultimately its operating performance. Using the top 10 integrated oil companies active in the upstream petroleum industry, we test the frame as a heuristic for interpreting the patterns in R&D expenditure, patenting, publications and operating performance metrics according to predicted effects. The panel-data econometric evidence supports most of the predicted effects, with the exceptions arguably affected by longer-term trends or by interesting divergences between firm views and employee behaviours. We conclude that there is evidence to support our view that technology frames matter because they set the boundaries in which firms plan and act, and they provide us with one means of conceptualising 'routines'.