

# Design Engineering and Advanced Manufacturing

## Summary

Today, manufacturing and a variety of service sectors lean heavily on synthetic environment modelling tools and validation techniques to ensure fitness for its intended purpose. In particular, the use of advanced design, simulation and modelling tools have become essential for competing globally with innovative and sustainable “products”, both physical and intangible, and continuing to deliver the new ranges of value-added services that increasingly support the UK economy and underpin our quality of life.

The Technology Programme is therefore inviting applications seeking financial support for new research and development projects that enable further technological advances or significantly reduce risk in this area. Applications should include the technology innovator(s) and end-users and show how they will exploit all outputs of the research. The successful consortium must clearly justify why government support is essential and how the project will meet the criteria for support.

## Background

The area of Design Engineering and Advanced Manufacturing is today a broad, highly complex technology field and in some areas it is a UK-strategic capability. This is particularly true in the aerospace, automotive, chemicals and the modern built environment sectors, which make extensive use of advanced techniques and must continue to innovate to retain their leading positions.

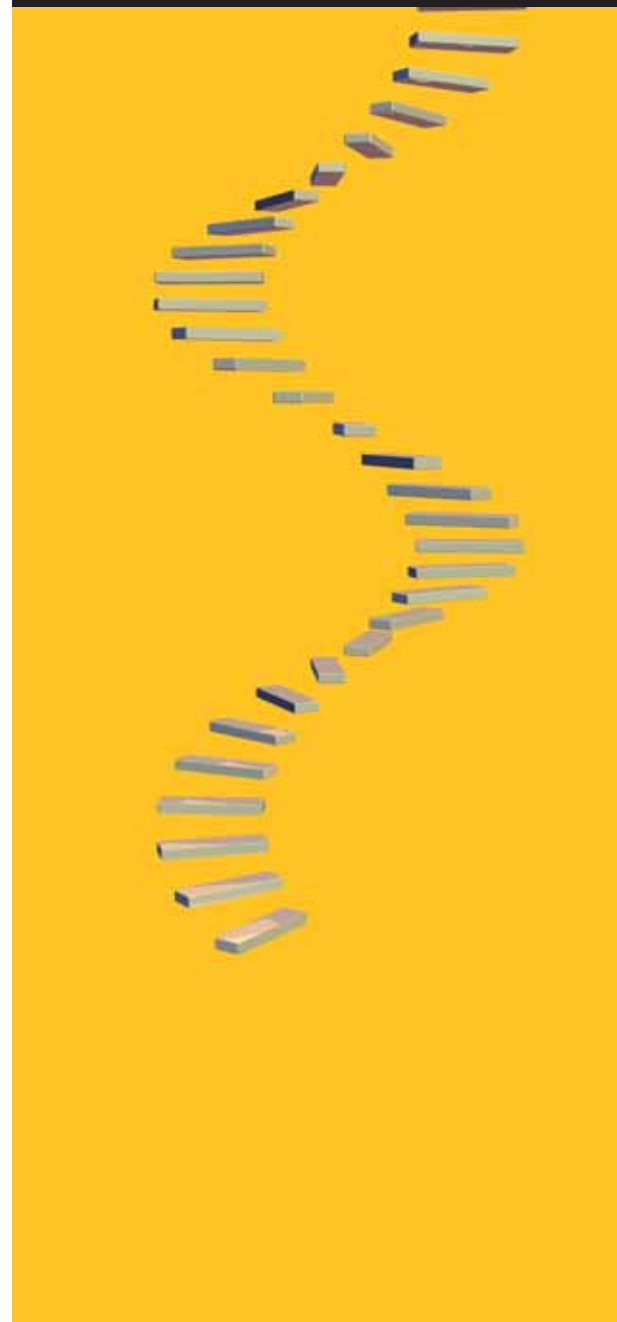


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**SUCCEEDING  
THROUGH INNOVATION**

Design Engineering and  
Advanced Manufacturing

COLLABORATIVE RESEARCH  
AND DEVELOPMENT



Underpinning the design and manufacturing process, simulation and modelling provides the means of representing physical or imaginary objects, processes, scenarios and environments, statically and dynamically, for scientific, engineering or business purposes. In engineering, manufacturing and processes industries, computational algorithms are used to design, simulate and model physical objects, their properties and their behaviour in various situations, often in real time. More recently, improved methods have increasingly replaced extensive physical experimentation and the construction of complex prototypes to reduce costs, shorten timescales and allow for exploring options. Whether systems are simple or complex, safety and sustained performance are today always near or at the top of the requirements list.

However, in some key areas, typically in the manufacturing arena, there still exists the need to build physical models, representations and/or prototypes to validate factors and processes that are not yet possible to simulate in the virtual world. Although this may apply widely, we are particularly focussing our interest on large scale strategic manufacturing technology validation projects in strategic areas with a good track record of manufacturing performance.

### Scope for Applications

We wish to encourage applications that, while addressing the areas listed above, exploit novel approaches to at least one or more of the following:

- Complex, dual element human-technology systems (e.g., modelling people flows in the built environment, health care delivery systems or virtual factories to evaluate new production systems);
- Design development processes for large scale manufacture and production – optimisation, technologies for achieving flexibility in production rates at low cost, assembly, disassembly, re-use and re-cycling including sustainability;
- Design development for reliability, safety, performance, availability and maintainability; where the scope might also cover design of low cost sensing, intelligent condition monitoring and/or fault tolerant machines;
- Design, simulation, modelling and/or prototyping of new technologies, systems and components e.g. multi-function modelling, modelling for noise reduction or electromagnetic analysis;
- New paradigms in simulation and visualisation with applications in the creative industries;
- New CAD tools and design methodologies (including formal methods, verification and simulation, design for test, reliability and manufacture).



The Competition is open to all manufacturing and production industry sectors, the modern built environment including construction, the creative industries and other business and financial services. Proposals with potential applications across several business sectors, which build on links between the academic and business research and which involve SMEs are especially welcome. Ideally, at least one partner with defined end-user needs should also be included. Collaborative proposals with non-UK based organisations using EUREKA or other EU mechanisms are eligible, although only the UK partners may receive financial support.

## Funding Allocation and Project Details

The Technology Strategy Board advises on the selection of priority technology areas and the allocation of funding for the Technology Programme. The Technology Strategy Board is currently being established as an executive non-departmental public body and will in future be responsible for the development and delivery of the Government's programme of technology support, including the Technology Programme.

An indicative £40m of Technology Programme support has been allocated to Collaborative Research and Development projects that address one or more of the areas indicated above and involve science-to-business and business-to-business interactions.

Typical projects would have 2-3 year duration, require support around £500k-£2m, although no project will be rejected on the grounds of size alone, and generally aim to implement significant business

change in a 5-7 year time frame rather than shorter-term payback. Larger projects will be considered but the case must be exceptional. Projects that are seeking in excess of £10m support must call the Technology Programme helpline on 01355 272155 before 25 May. In particular we would encourage projects that can demonstrate benefits to a number of business sectors, and ideally should include at least one partner with defined end-user needs.

Additional funding from EPSRC may be available for projects where there is a significant high quality academic component and in particular for those projects that demonstrate added value to its existing portfolio; by building on or being complementary to existing research programmes.

Projects can range from small, highly focused basic research aimed at establishing technical feasibility, though to applied research, and to experimental development projects. It is anticipated that most of the funding will be allocated to proposals in the applied R&D (attracting 50% public funding) or experimental development (25% public funding) categories. Projects involving industry oriented basic research (75% public funding) will also be considered but a robust case must be made to support the requested level of funding. Definitions of the above categories of research can be found in the Guidance for Applicants – see <http://www.dti.gov.uk/innovation/technologystrategy/index.html>

*The Technology Strategy Board will require all projects to provide a non-commercially confidential summary, at the start and the conclusion of the project, for dissemination.*



## Contacts

If you have any queries about the technical scope of the competition or the application process, please contact the Technology Programme helpline on **01355 272155** or email **[info@technologyprogramme.org.uk](mailto:info@technologyprogramme.org.uk)**

## Key Dates

Competition opens: 24 April 2007

Competition event in London - 25 April 2007. For more information about this and other events use the web address below.

Deadline for projects seeking in excess of £10m support to call the Technology Programme helpline: 25 May 2007

Deadline for registering your intention to submit an application: 11 June 2007

Deadline for all Academic Finances through the Je-S systems: 14 June 2007

Deadline for all Outline applications: 18 June 2007

Full stage opens: 16 July 2007

Deadline for receiving full stage applications: 11 September 2007

Decision and feedback to applicants: October 2007

For details on how to register and apply go to:

<http://www.dti.gov.uk/innovation/technologystategy/index.html>