

Quick Reference

Please note that you must read this full Call document for guidance before submitting your proposal

ISCF Manufacturing Made Smarter Research Centres

Call type: Full Proposals

Key Information

Funding available or Maximum/Minimum amount available	We expect to fund up to 4-5 Centres, with total funding available of up to £20 million.
Type of funding	Research grant
UKRI funder(s) Lead council listed first	EPSRC delivering, on behalf of UKRI, in conjunction with Innovate UK and ESRC.

Overview

On behalf of UKRI and the ISCF Manufacturing Made Smarter Challenge, EPSRC are offering up to £20 million for up to 4-5 Centres delivering multidisciplinary research in the area of Digital Manufacturing. Research should cover both technological and societal aspects, and should be driven by industry-identified challenges.

Assessment Process: Applicants **must** have submitted an Expression of Interest (EOI) in order to apply to this call. Full proposals will undergo postal peer review. Applicants receiving supportive reviews will be invited to attend an interview panel. Final funding decisions will be made using a portfolio approach, to ensure coverage across the four Innovation Themes.

Key Dates:

Activity	Date
Deadline for Expressions of Interest	23 September 2020
Full Call launched	24 September 2020
Deadline for Full Proposals	16:00 17 December 2020
Interview Panel	12 - 23 April 2021
Funding decision	May 2021
Earliest grant start date	07 June 2021

- To be eligible, **applicants must have submitted an EOI.**
- Grant duration is fixed at 42 months.

- Project partners are mandatory and project partner co-funding contributions (cash or in-kind) must equal at least 25% of the EPSRC contribution at the outset of the Centre grant, rising to 60% by the end of the Centre grant.
- Submissions to the full proposal stage **will** count towards the Repeatedly Unsuccessful Applicants Policy.

Contacts:

ISCF Manufacturing Made Smarter mailbox: iscf.mms@epsrc.ukri.org

Richard Bailey: Richard.Bailey@epsrc.ukri.org

For help and advice on costings and writing your proposal please contact your Research Office in the first instance, allowing sufficient time for your Organisation's submission process.

Any queries regarding the submission of proposals through Je-S should be directed to the Je-S helpdesk: JeSHelp@je-s.ukri.org, 01793 444164 (please refer to Je-S homepage <https://je-s.rcuk.ac.uk/> for phone line opening hours).

ISCF Manufacturing Made Smarter Research Centres

Call type: Full Proposals

Closing date: 16:00, 17 December 2020

Related themes: Manufacturing the Future, Digital Economy, Engineering, ICT, Mathematical Sciences, Physical Sciences, Artificial Intelligence & Robotics, Business and Management Studies, Social Anthropology, Innovation Studies

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Opportunity Summary

- We expect to fund up to 4-5 Research Centres, with up to £20 million (80% FEC) from the ISCF Manufacturing Made Smarter Challenge
- The overall aim is to help the UK's manufacturing industry become more productive and competitive through innovation and adoption of digital technologies
- Although this call is being delivered by EPSRC, there is no requirement for the majority of the research to fall within EPSRC's remit
- This call uses standard UKRI eligibility
- To be eligible to submit a full proposal, applicants must have submitted an expression of interest
- At submission of the full proposal, project partners are expected to make a total financial co-funding commitment of at least 25% of the EPSRC contribution, rising to at least 60% by the end of the grant
- Submissions to this call **will** count towards the EPSRC Repeatedly Unsuccessful Applicants Policy

Who can apply

Standard EPSRC eligibility rules apply: Research grants are open to UK higher education institutions, research council institutes, UKRI-approved independent research organisations and NHS bodies with research capacity.

Read the guidance on institutional eligibility <https://www.ukri.org/funding/how-to-apply/eligibility/>.

You can apply if you are resident in the UK and meet at least one of the bullets below:

- are employed at the submitting research organisation at lecturer level or equivalent
- hold a fixed-term contract that extends beyond the duration of the proposed project, and the host research organisation is prepared to give you all the support normal for a permanent employee
- hold an EPSRC, Royal Society or Royal Academy of Engineering fellowship aimed at later career stages
- hold fellowships under other schemes (please contact EPSRC to check eligibility, which is considered on a case-by-case basis).

Holders of postdoctoral level fellowships are not eligible to apply for an EPSRC grant.

Individuals and organisations who do not meet the above criteria, and therefore ineligible to apply as investigators or as the lead organisation, are encouraged to get involved with Research Centre proposals by collaborating with eligible investigators/organisations as Project Partners.

If you are currently restricted under the Repeatedly Unsuccessful Applicants Policy, you may submit unlimited Expressions of Interest, but you will only be able to submit one full proposal (as PI or Co-I) during the 12 month restricted period. Further information about the policy can be found at: <https://epsrc.ukri.org/funding/howtoapply/basics/resubpol/rua/>.

What we're looking for

Synopsis

The objectives of this call are to:

- Bridge the gap between basic research and its application in manufacturing to provide a pipeline of digital technologies for the future
- Co-create projects with industry, focusing on addressing user needs
- Integrate technological and societal aspects of manufacturing research, ensuring technologies are developed with people in mind to improve adoption and acceptance of new ways of working
- Network with the portfolio of Manufacturing Made Smarter investments and other relevant projects, to ensure connectivity across the landscape and leverage the maximum benefits.

All Centres will be expected to undertake 3 strands of activity:

1. **Underpinning, fundamental programme of** research (up to 50%) (for technology-focused work, this means within Technology Readiness Levels (TRLs) 1-3). This research must be co-created

with industry and focused on application to the Manufacturing sector. Centres are encouraged to include ambitious, transformative ideas within their programme.

2. **Response to emerging industry needs (up to 50%)** (for higher TRL research). Centres are expected to be agile in addressing new industry challenges as they evolve, as well as how the new developments and insights can be applied by the sector, as appropriate.
3. **Networking (up to 5%)**. Centres must collaborate and network with the cohort of ISCF Manufacturing Made Smarter Research Centres and with other ISCF Manufacturing Made Smarter Challenge investments and activities, as appropriate.

Guidance on TRLs and the research landscape can be found here: <https://epsrc.ukri.org/research/ourportfolio/themes/healthcaredtechnologies/strategy/toolkit/landscape/>.

Scope

Research should be focused on at least two of the four Innovation Themes described below. We are looking to fund Centres delivering multidisciplinary research across themes (although Centres may choose to focus on one/some more than others, and do not have to include them all).

We expect **all Centres** to include aspects of the fourth Innovation Theme (societal and cultural change) and to consider these aspects across all the research carried out by the Centre. This may be as a major or minor component of the research effort.

Although this call is being delivered by EPSRC, **there is no requirement for the majority of the research to fall within EPSRC's remit.**

1. Smart connected factory

The overall intent of this theme is to harness technologies to optimise the design and execution of current and future factories. Whilst not a complete list, areas of potential interest include:

- Manufacturing process and operations
 - Use of robotics or additive manufacturing to accelerate processes
 - Dynamic, real time production planning and scheduling
 - Digital twins of facilities and processes to optimise future designs or optimise current state
 - Real time/in process quality monitoring and process optimisation
 - Digital track and trace systems
- Asset management optimisation
 - Predictive analytics
 - Augmented support for maintenance
- Embedded certification, verification and validation - simulation and statistical analysis

- Use of robotics and autonomous systems in manufacturing or warehouse operations to improve productivity or worker safety
- Connected worker – augmented & virtual solutions for task assistance, training or safety
- The integration of cyber and physical production systems

2. Connected and versatile supply chain

The overall intent of this theme is to harness technologies to optimise the design and execution of current and future supply chains. Areas of potential interest include:

- Interoperability and understandability of data across value chains
- Supply chain design:
 - End to end supply chain visibility and effective risk management through transparency, collaboration & trust
 - Inventory optimisation
 - Sustainable supply chains for increased flexibility
 - Warehouse optimisation through the consideration of logistics and infrastructure usage
 - Confidence in shared data considering provenance, traceability, verification & quality management
 - New business models that affect the supply chain configuration, such as distributed manufacturing or manufacturing as a service
- Supply chain execution:
 - Demand management, sensing and shaping
 - Proactive use of demand data for supply chain performance optimisation
 - Improved decision-making through analytics and artificial intelligence (AI)
 - Production planning or scenario modelling
 - Track-and-trace technologies, traceability and provenance

3. Adaptable, flexible manufacturing operations and skills

- Enabling customisation: adapting processes to smaller batch size production, rapidly configurable processes with reduction of design and production time.
- Flexible /distributed manufacturing using a flexible network of supply and skills to manage volatility/disruption effectively.
- Simulation and understanding of real work using data from people and industrial systems, efficient transfer of trial results to the workplace.
- Safety and human-machine interactions - ergonomics, sensing, big data, and psychosocial effects.

4. Societal and cultural change - managing the disruptive impact of digital technologies

- Reconsidering the design of jobs, roles and organisations to incorporate new skills and activities (e.g. Artificial Intelligence or Internet of Things) to optimise the future of work in manufacturing.

- Fully understand the human factors in design of technology solutions to optimise their impact including human interactions with safety, cyber and ethics issues.
- Developing people with broader skills in order to thrive in more diverse and flexible teams.
- Acceptability of working in a technology rich environment.
- Ethical and privacy considerations of data ownership and use.
- Disruption to regulatory processes and approaches to safety and audit of production processes.

Funding Available

We expect to fund up to 4-5 Centres, with total funding available of up to £20 million (80% FEC).

At the point of submitting the full proposal, Project Partners are expected to make a total financial co-funding commitment of at least 25% of the EPSRC contribution (demonstrated by Project Partner Letters of Support). As part of the Industry Collaboration Plan, which is required as part of the application, Research Centres will need to describe how they plan to secure additional co-funding over the lifetime of the Centre. This may be through increasing commitments of existing Project Partners and/or by bringing additional Project Partners on board.

The total co-funding requirement to be achieved by the end of the grant is at least 60% of the EPSRC contribution. This will be monitored by EPSRC throughout the grant.

Equipment over £10,000 in value (incl. VAT) is not available through this call. Smaller items of equipment (individually under £10,000) should be in the Directly Incurred - Other Costs heading.

For more information on equipment funding, please see: <https://epsrc.ukri.org/research/facilities/equipment/>.

How to apply

In order to be eligible to apply to the full proposal stage, you must have already submitted an EOI.

Applicants should ensure they are aware of and comply with any internal institutional deadlines that may be in place. You should prepare and submit your proposal using the Research Councils' Joint electronic Submission (Je-S) System (<https://je-s.rcuk.ac.uk/>).

When adding a new proposal, you should select:

- Create New Document
- Council 'EPSRC'
- Document type 'Standard Proposal'
- Scheme 'Standard'

- On the Project Details page you should select the 'ISCF Manufacturing Made Smarter Research Centres' call.

After completing the application:

- You must 'Submit document' which will send your application to your host Organisation's administration
- Your host Organisation's administration is required to complete the submission process. Applicants should allow sufficient time for your Organisation's submission process between submitting your proposal to them and the call closing date.

EPSRC must receive your application by **16:00 on 17 December 2020**.

As well as the Joint Electronic Submission (Je-S) Application Form, the following documents must be submitted:

Attachment Type	Maximum page length	Extra Guidance
Case for Support	Eight pages	<p>Up to 2 pages for the expertise and track record of the team. This should cover all the members of the core team, including industry Project Partners who are part of the core team.</p> <p>Up to 6 pages describing the proposed research and its context. This section should demonstrate to those reviewing the proposal what you intend to achieve, why it is timely and important, and your detailed plan for how you will achieve your objectives. You may wish to consider the call objectives and ISCF Manufacturing Made Smarter Challenge objectives when setting your Centre's objectives.</p> <p>Further guidance can be found here: https://epsrc.ukri.org/funding/applicationprocess/preparing/writing/caseforsupport/.</p>
CVs	Two pages each	For named and visiting researchers, and researcher co-investigators only.
Workplan	One page	Should be illustrated with a simple diagrammatic work plan, such as a Programme Evaluation and Review Technique (PERT) or Gantt chart.
Justification for Resources	Two pages	<p>This section should explain the necessity of your requested resources to the proposed Research Centre. This helps reviewers make informed judgements about whether the resources requested are appropriate for the research proposed.</p> <p>So nothing is missed, we recommend you follow the 'Cost to Proposal' headings used in the application form.</p>

		For more information, see here: https://epsrc.ukri.org/funding/applicationprocess/preparing/writing/jor/ .
Industry collaboration plan (To be uploaded as attachment type 'Additional Document')	Two pages	Describing how you will: <ul style="list-style-type: none"> • Bring more Project Partners on board • Ensure additional co-funding (to achieve at least 60% of the EPSRC contribution by the end of the grant) • Ensure that development and delivery of research projects is carried out with users, diffusion, and adoption in mind • Make best use of the financial, in-kind, and intellectual contributions of Project Partners to ensure that projects are co-created and co-delivered • Continue engaging with existing Project Partners, ensuring they remain a core part of the delivery team.
Project Partner Letters of Support	No page limits	Must be included from all named Project Partners. Must be on headed paper and be signed and dated within six months of the proposal submission date.
Proposal Cover Letter	No page limit	Must include the mandatory Expected Impacts table, shown in the Supporting Documentation section (link to editable version provided in the Related Content sections). Within the table, you should provide estimates of your expected impacts by the end of the project and by 3 years after the project ends. The cover letter can also be used to highlight any other important information to EPSRC. This attachment type is not seen by reviewers or panel members.

You should attach your documents as pdfs to avoid errors. They should be completed in single-spaced Arial 11 font or similar-sized sans serif typeface.

For advice on writing proposals see <https://epsrc.ukri.org/funding/applicationprocess/preparing/>.

You should ensure that you **fully address all the assessment criteria**, as described in this document.

EPSRC will not fund a project if it believes that there are ethical concerns that have been overlooked or not appropriately accounted for. All relevant parts of the Ethical Information section must be completed. Further guidance on completing the Je-S form can be found at <https://je-s.rcuk.ac.uk/Handbook/pages/GuidanceonCompletingaStandardG/EthicalInformation.htm>. EPSRC guidance can be found under Additional Information.

How we will assess your application

Assessment Process

Your proposal will be checked by UKRI staff and may be returned to you for amendment, if it does not meet our requirements (e.g. attachment type/length, font size etc.).

It will then be sent to appropriate expert reviewers for assessment against the assessment criteria. If the reviews are unsupportive, your proposal will be review rejected at this point.

If the reviews are sufficiently supportive, the proposal will be assessed and ranked by an independent panel based on the reviewers' comments and the applicant response, using the full assessment criteria provided below. The panel will consist of relevant experts from across the scope of the call. Successful proposals will be invited to attend the interview panel.

At the interview panel, panel members will score each proposal against the assessment criteria to create a rank-ordered list. The interview panel will be held between 12-23 April 2021 and you should hold these dates free until otherwise notified. We will contact you with exact dates when these have been confirmed.

After the interview panel, we will make the funding decision, taking into account the panel's recommendations against the assessment criteria, the coverage across Innovation Themes, and the coverage across regions/nations of the UK. You will be contacted within 2 weeks with the outcome.

In the event of this call being substantially oversubscribed as to be unmanageable, EPSRC reserve the right to modify the assessment process.

Assessment Criteria

Standard assessment criteria

- **Quality** (Primary) The degree of research excellence of the proposal, including:
 - The novelty, relationship to the context, timeliness and relevance to identified stakeholders;
 - The ambition, adventure, transformative aspects or potential outcomes;
 - The suitability of the proposed methodology and the appropriateness of the approach to achieving impact.
- **Importance** (Secondary major) The national importance of the research. How the research:
 - Contributes to, or helps maintain the health of other disciplines, contributes to addressing key UK societal challenges and/or contributes to future cross-sectoral economic success and development of emerging industries;
 - Meets national needs by establishing/maintaining a unique, world-leading activity;

- Complements other UK research funded in the areas, including any relationship to the UKRI portfolio, particularly the ISCF Manufacturing Made Smarter Challenge.
- **Applicant and partnerships** (Secondary) The applicant team's ability to deliver the proposed project, including:
 - Appropriateness of the track record of the applicants;
 - Balance of skills of the project team, including collaborators;
 - Suitability of the plans for industry engagement, as described in the Industry Collaboration Plan, including:
 - Evidence that applicants have a realistic plan to achieve the mandatory 60% co-funding requirement by the end of the grant;
 - Demonstration of how applicants will ensure full industry involvement, ensuring that the research programme is co-created and co-delivered with industry; addresses industry needs and challenges; and has cross-sectoral users, diffusion and adoption in mind.
- **Resources and management** (Secondary) Effectiveness of the proposed planning and management and whether the requested resources are appropriate and have been fully justified, including:
 - Any equipment requested, or the viability of the arrangements described to access equipment needed for this project, and particularly on any university or third-party contribution;
 - Any resources requested for activities to either increase impact, for public engagement or to support responsible innovation.

Call specific criteria

- **Fit to call scope** (Primary) The degree and extent to which the proposed research aligns with the scope of the call, including how well the proposed research:
 - Addresses the call objectives and the aims and objectives of the ISCF Manufacturing Made Smarter Challenge;
 - Addresses industry-identified challenges within Digital Manufacturing, as applied across manufacturing sectors;
 - Is multidisciplinary, covering both technological and societal aspects of Digital Manufacturing, as demonstrated by effective coverage of at least 2 of the Innovation Themes (one of which being Societal and Cultural Change).

Feedback

You will receive feedback on your full proposal in the form of reviewer reports from the postal peer review stage.

There will be no further feedback after the interview stage, unless specifically requested by the panel.

Nominating Reviewers

As part of the application process you will be invited to nominate up to three potential reviewers who you consider to have sufficient expertise to assess your proposal. Please ensure that any nominations meet the EPSRC Policy on conflicts of interest.

For more information about the reviewer selection process please see the related content links.

Guidance for reviewers

Information about the EPSRC peer review process and guidance for reviewers can be found at:

<https://epsrc.ukri.org/funding/assessmentprocess/review/>.

Reviewers will be asked to add comments on the "Fit to Call Scope" criterion to the "Call Specific Criteria" box on the reviewer form.

Additional Information

Background

This funding originates from the Industrial Strategy Challenge Fund (ISCF) and the call is part of the ISCF Manufacturing Made Smarter Challenge. The overall aim of the Manufacturing Made Smarter Challenge is to help the UK's manufacturing industry become more productive and competitive through innovation and adoption of digital technologies.

The Manufacturing Made Smarter Challenge has a number of objectives. Those that are relevant to this call, and to which Research Centres will be expected to contribute, are listed below:

- Increase UK manufacturing sector investment in industrial digitalisation R&D and increase the adoption of new Industrial Digital Technologies.
- Increase cross-sector collaboration between UK manufacturing sectors to drive the creation of common digital solutions.
- Increase the number of collaborations between SMEs and larger, more established companies up the value chain.

For more information about EPSRC's portfolio and strategies, see our website: <https://epsrc.ukri.org/research/ourportfolio/>.

Supporting Documentation

Table of expected impacts

This table must be completed and included in your proposal cover letter. We require this information as part of the monitoring and evaluation for the ISCF Manufacturing Made Smarter Challenge. It will not be seen by reviewers or panel members and does not form part of the assessment process.

Within the table, you should provide estimates of your expected impacts by the end of the project and by 3 years after the project ends.

- Please fully complete the table and do not leave any boxes blank.
- You may give exact figures or a range.
- Please enter 0 for any impacts that are not relevant and that you therefore don't expect to achieve.

No.	Benefit or impact	By end of project	By 3 years after project end date
1	Number of patent applications filed		
2	Number of novel technology solutions developed or in development		
3	Number of demonstrators developed		
4	Number of use cases developed, including any in different industrial sectors		
5	Number of new standards created, including BSI, PAS or industry-specific		
6	Number of spin-outs or start-ups formed		
7	Number of academic papers published and/or conference papers presented		
8	Number of new innovative, disruptive, or transformational business models developed		
9	Increase in number of people gaining skills and acquiring new knowledge in digital manufacturing topics.		
10	Number of technologies/products ready for adoption by project partners or others		
11	Number of businesses adopting innovative digital solutions from the project		
12	Number of industry sectors engaged/involved in this project. Include sectors which are partners in the project as well as sectors for which a use case will be developed.		
13	Anticipated £ value of additional investment by consortium partners (in excess of the 25% mandatory co-funding at time of application)		
14	Anticipated % decrease in costs (labour, materials, energy, other resources) through adoption of the project's outcomes		
15	Anticipated £ increase in annual revenue for project partners		
16	Anticipated £ value of foreign inward investment secured		
17	Anticipated £ increase in annual value of exports for project partners		
18	Number of jobs created. Please provide this number as the total full-time equivalent (FTE).		
19	Anticipated number of UK businesses within supply chains benefitting from project outputs		

20	Number of new technology solutions available for commercial sale		
21	Number of new digital technology products available for commercial sale		
22	Anticipated % reduction in waste (material, energy, other resources)		
23	Anticipated % increase in productivity (increase in value added per person)		
24	Any other benefits expected from this project. List each additional benefit on a separate line (add rows to the table as needed).		

Related Content

- Table of expected impacts (editable version)
- [Call document for the Expression of Interest stage](#)
- [Resubmissions](#)
- [Repeatedly unsuccessful applications](#)
- [Equipment](#)
- [Use of animals](#)
- [Responsible research and innovation](#)
- [Ethical considerations](#)
- [Equality, Diversity and Inclusion](#)
- [Reviewer selection](#)
- [Conflicts of interest](#)
- [DORA](#)
- [Equality Impact Assessment](#)

Change log

Name	Date	Version	Change
Richard Bailey	16/09/20	1	Version launched
Richard Bailey	25/09/20	2	Modification of selection process