

REQUEST FOR EXPRESSIONS OF INTEREST

SUGAR MILL 4.0: DEVELOPING THE MILLING
AUTOMATION FRAMEWORK

SRA Investment Area: Research Mission 1

PROFITABLE AND PRODUCTIVE

Continuous improvements in farming and milling profitability

Closing Date: 5:00pm 13th of August 2021

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1. BACKGROUND

Sugar Research Australia (SRA) invests in and manages a portfolio of RD&A projects that drive productivity, profitability, and sustainability for the Australian sugarcane industry. As an industry-owned company, SRA is committed to setting the right targets, managing research investments to maximise the likelihood of success, and ensuring the delivery and adoption of project outcomes and impacts across the Australian sugarcane industry. SRA's [Strategic Plan 2021-2026](#) recognises that the future of the industry will be underpinned by innovation and a focus on impactful investment in research and development, together with an industry motivated to adopt and adapt.

Technology improvements in recent years have led to what is dubbed the Fourth Industrial Revolution, or Industry 4.0. The focus of Industry 4.0 is on digitisation, process improvement, productivity optimisation and automation, and these can be driven by combinations of big data analytics, simulation, additive manufacturing, horizontal and vertical data/information integration, industrial internet of things, augmented reality, advanced robotics, and cloud computing. The Sugar Mill 4.0 concept offers a promising solution to the ongoing profitability and operational issues associated with high labour costs and the loss of experienced staff in sugar mills.

Increased automation is the first step towards the sugar mill of the future ("Sugar Mill 4.0") and it was a high priority identified by SRA's Milling R&D Program (<https://sugarresearch.com.au/research/milling/>), and the principles described above are the enablers for this outcome. If we can map the pathway accurately, future investments towards mill automation will follow a systematic and informed approach.

Automation will require a step-by-step process for implementation, including implementation of sensors at key steps in the mill (gathering information), interpretation/analysis of the data from these sensors (gaining knowledge), development of algorithms to predict outcomes (gaining wisdom), and finally using these algorithms to facilitate automation through closed-loop systems. A clear understanding of process architecture and an over-arching framework will be required to ensure communication and compatibility across the factory, and research addressing the different areas above needs to be systematic and planned so that mills can adopt changes as they are developed.

Our international sugar-producing competitors are either already adopting automation (e.g. <https://www.soteica.com.br/copia-s-paa>) or actively investing in research programs that will lead to automation (e.g., <https://www.smri.org/research/stepsf40/Pages/overview.aspx>), and the Australian industry risks losing ground against these competitors if we miss out on the benefits from automation and the potential offered by advanced optimisation from advanced digitisation platforms.

2. TERMS OF REFERENCE

Mill automation requires technology to be developed across the processing chain, with varying levels of payback and adoptability at each stage of sugar processing. Staged investments in research that consider system-wide implications, potential cost-savings, labour constraints, ease of automation, transferrable technology, potential for feasible solutions and infrastructure limitations will increase the adoption of those technologies, with maximised return on investment. While some sensors are already utilised in mills and some research on new applications is on-going, there needs to be an overarching framework to ensure that an optimal pathway to mill automation is mapped out in a way that allows maximum productivity and profitability benefits to be realised in an optimal time frame. The identification of relevant technologies that are already available but have not been adopted by mills will also lead to better understanding of the mill needs, capital cost barriers and suitability of available technologies for adoption by mills.

SRA is seeking EOIs from suitably qualified and experienced organisations or individuals to undertake exploratory research to develop a potential pathway for mill automation to support Sugar Mill 4.0. The

study will also inform SRA about R&D gaps in this area and guide future investments in mill automation technology.

3. EOI OUTPUTS

The activities and outputs for this work will include a stage-gate process. A report should be delivered after each stage and following delivery of the report SRA will review its commitment to proceeding to the next stage.

STAGE1:

1. A global scan of sugar mill automation technologies under development, near-to-market or commercially available.
2. An understanding of the current state of sugar mill automation across the Australian sugar industry.

Go/No-go decision by SRA

STAGE 2:

3. Identification of future targets for automation in sugar mills including cane delivery to mill.
4. An over-arching framework that will prioritise future targets for automation and ensure that “whole-of-factory” impacts are understood.
5. Identification and estimation of benefits to both millers and growers arising this framework.
6. Recommendations for R&D needed to improve automation in sugar mills for process optimisation, reduced maintenance, and reduced labour costs.

4. TIMEFRAME AND PRICING

DATE	ACTION
16 JULY 2021	Expressions of interest sought by SRA
13 AUGUST 2021	Closing date for submission of EOI
15 AUGUST - 30 SEPTEMBER	EOI Assessment Period
1 OCTOBER 2021	Successful applicants notified
4-8 OCTOBER 2021	Pre-contract meeting and negotiation period to discuss and agree on requirements to be met before an offer can be made by SRA
11-29 OCTOBER 2021	SRA project agreement finalised and signed
1 NOVEMBER 2021	Expected project start date
1 DECEMBER 2022	Project completion date
BUDGET	Maximum budget available: \$200K + GST

5. SUBMISSION REQUIREMENTS AND INFORMATION

5.1 PROPOSAL REQUIREMENTS

EOIs must be submitted through the online Application Portal - SugarNet
<https://grants.sugarresearch.com.au/omniNet>

Proposal Form and further guidelines are available in SugarNet.

5.2 CRITERIA FOR SELECTION

SRA will use its Research Funding Panel to assess all submissions. All proposals will be reviewed for completeness and the extent to which they address the assessment criteria (below). Clarification of issues identified may or may not be undertaken. Non-conforming proposals or those containing insufficient information to properly assess their ability to satisfy the EOI will not be considered further.

The following assessment criteria will be used to evaluate submissions:

- Organisation capability and resources of the applicant to deliver within the timeframe required.
- Qualifications and technical skills of the proposed project team.
- Degree of understanding of the project to be delivered within the proposal.
- Demonstrated experience in conducting similar projects including standard of outputs; completion on time including meeting milestones and deadlines; completion within agreed budget; achievement of quality aspects.
- Suitability of the proposed methodology to meet the requirements of the Terms of Reference; and
- Value for money.

5.3 SRA RIGHTS

SRA reserves its rights at law or otherwise to:

- cease to proceed with or suspend the EOI process.
- alter timing of the EOI process.
- vary the EOI structure.
- vary any time or date specified in the EOI.
- require additional information or clarification from the applicant.
- enter into negotiations or discussions with more than one applicant.
- request a new EOI.
- reject any EOI received after the closing date as described in this document.
- reject any EOI that does not comply with the requirements as described in this document, negotiate, and enter final contractual documentation with respect to the project with any counterparty without prior notice.
- not attribute any reasons for actions or decisions taken, including on the exercise of any or all the above-mentioned rights; and
- take such other action as they consider appropriate in relation to this RFP process.

5.4 CONDITIONS OF LODGEMENT

The applicant agrees, by lodging an Expression of Interest, that it is bound by these conditions:

- All Expression of Interest documents become the property of SRA upon lodgement.
- It warrants that all information in the EOI is accurate and complete.
- That it has declared any actual or potential conflict of interest.
- That it will bear all costs for preparing the EOI submission, including any meetings that may be required related to the submission prior to the contracting stage.
- That it will keep confidential any confidential information provided by SRA in connection with the EOI.
- That it will make any inquiries relating to the EOI process only through the contact details provided; and
- That pursuant to the *Privacy Act 1988* (Commonwealth) it will be bound by the Australian Privacy Principles in respect of any act done or practice engaged in by the respondent in connection with this EOI process.

Expressions of Interest are to be submitted to SRA **by 5.00pm on the 13th of August 2021** through the online Application Portal - SugarNet <https://grants.sugarresearch.com.au/omniNet>

6. SRA CONTACT

Requests for further information or clarification in relation to this request for Expressions of Interest should be directed to:

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