

SMART FOUNDRY

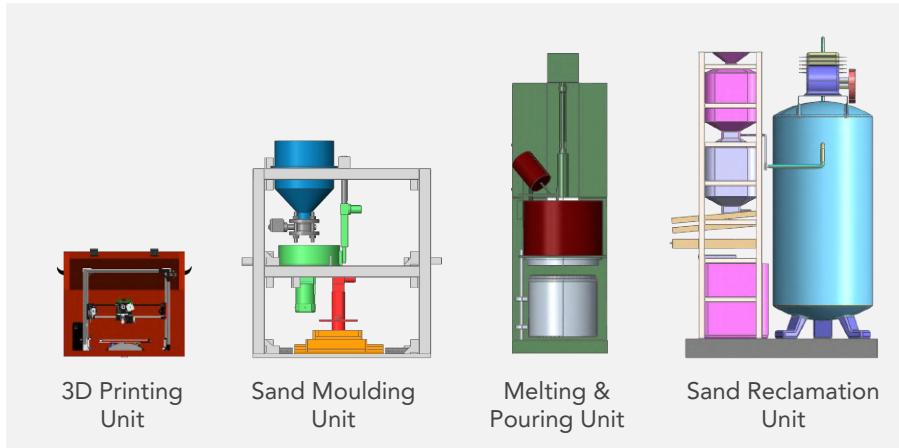
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Overview

Sustainable Metal-casting by Advanced Research and Technology (SMART) Foundry is a national project involving a dozen institutes to develop a compact and low-cost system to manufacture metal parts required in small numbers.

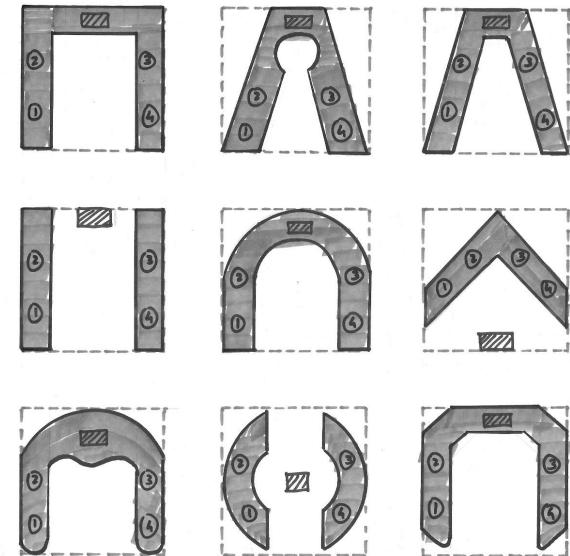
The focus of my job was to design a layout that encompasses four units within a space of 5x5 m, and which can be handled by 1-2 people.

As part of my work, CAD models of units sent from different teams were corrected and modified. Their enclosure, control panel and dashboard were designed and modelled.



Layout Ideation

Keeping in mind the sizes of units, ease of access, and safety, a suitable layout with an enclosure was selected after initial ideation.



Layout Design

The layout enclosure was designed on Solidworks for the four units, such that the foundry system can be operated effectively within a compact space.

2 - Sand Moulding Unit



1 - 3D Printing Unit



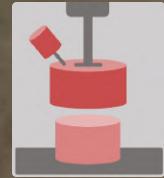
CAD Workstation
For STL slicing before
3D printing.

Control Panel
Start/Stop and
Emergency buttons

Height Adjustment
Brings moulding unit to
a convenient height.



3 - Melting & Pouring Unit



4 - Sand Reclamation Unit



Ample Space
All units are distanced
at more than 1m from
the central area

Enclosure Design

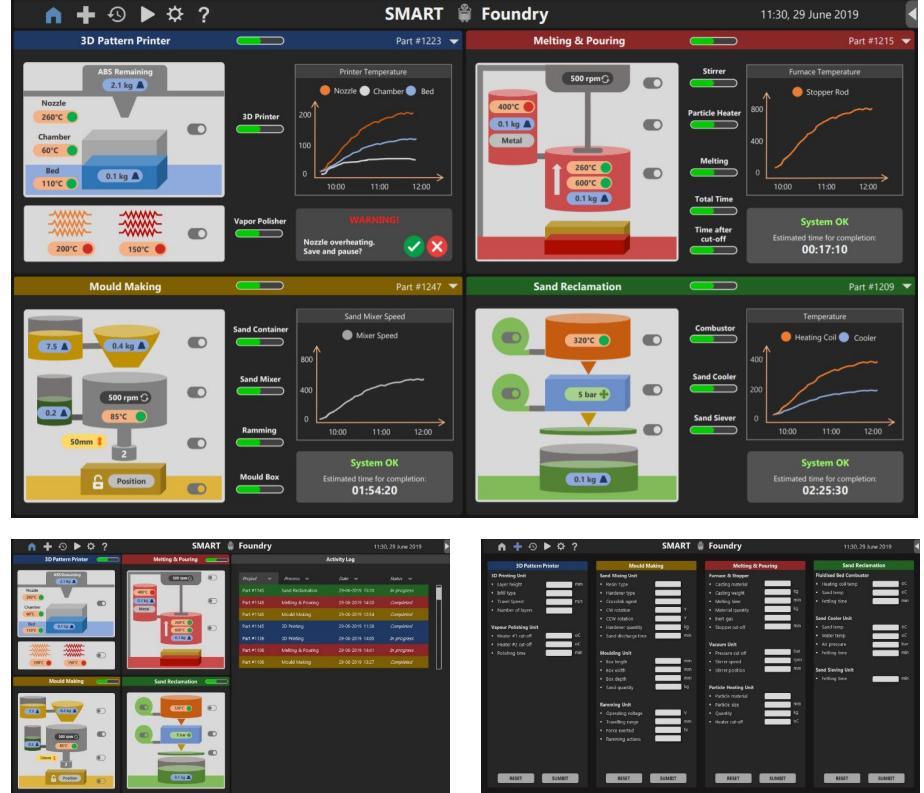
The enclosure is in the form of a table, designed to bring all units to user's level. It also provides a storage space for raw materials and tools.



Enclosure for the molding unit brought to mid-height

Dashboard Design

This was designed to view, control and analyse the job progress. It has a window for each unit showing a schematic, progress bars, key parameters, real-time graphs, job completion time and warning messages. Other tabs show activity log, user inputs and analysis.





SMART Foundry

A compact and minimal foundry system; giving easy access to view and control its four units through a custom enclosure and dashboard.