"FOUNDRY 4.0" Using FRP
Driving the Digital Transformation

A series of 6 Articles showcasing: "How foundries can move the next step into "INDUSTRY 4.0" level.

(Part-1)

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Foundries *are the last frontier when it comes to digital transformation and digitalization of company processes – ancient traditions carried forward by generations and huge amounts of experience may be replaced by modern state-of-the-art software solution technologies, making the industry attractive to young talent. This first article (in a series of 6) shall highlight* ***how foundries can follow the trend****, become operationally more successful, and take part in the "****Industry 4.0****" revolution everybody is talking about.*

Preamble

Although metals & alloys have been melted and cast in foundries for many centuries; ever since Planning and Control systems were introduced, processes have changed, and these are now constantly being put to test. You just cannot do things by "rule of thumb" anymore today. Cost transparency, material and energy efficiency and process security in real time; combined with the much quoted "fast time to market", have become essential if foundries want to survive. The **digital transformation** in foundries is taking place right now.

Industry 4.0 and Foundry 4.0

Everybody has heard of **Industry 4.0**, and as per Wikipedia *(Fig. 1)* it describes the evolution from Mechanization (Level 1.0), to Mass Production (Level 2.0), to Computer and Automation (Level 3.0); and now Cyber-Physical Systems in the corporate world (Level 4.0). In the same line, **foundries** must follow this trend. With many foundries still not there yet at Level 3.0, and with Level 4.0 already looming, a widening gap will be seen.

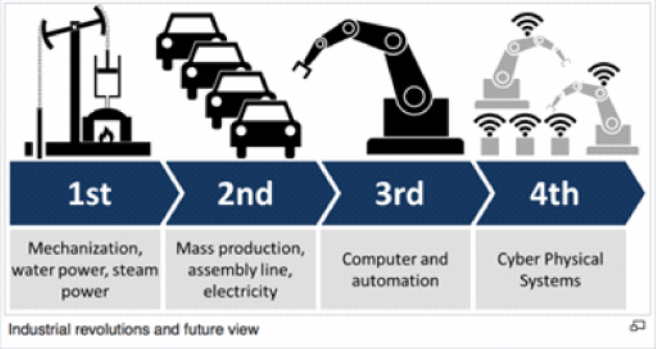

Fig. 1 : *Industrial Revolutions & Future View* *(Source: Wikipedia)*

FRP = Foundry Resource Planning solution technology

To achieve **FOUNDRY 4.0**, it will be essential to embrace – among others – **FRP** solution technology**. FRP** is derived from the well-known abbreviation **ERP** which stands for **E**nterprise **R**esource **P**lanning. But instead of an undefined "Enterprise" we focus exclusively on "Foundries", which have significantly different corporate processes compared to standard ERP systems users – this has led to the abbreviation **FRP or Foundry Resource Planning solution technology**, taking care of ALL foundry specific processes – from inquiry to delivery of castings.

Many times Software companies consider a **foundry** as 'another common enterprise'. But make no mistake – a "Foundry" is not a common enterprise. Its processes are very unique, as no other industrial branch in this business line actually creates things and provides final shapes from liquid metal. The process of casting determines all mechanical properties, which all other industries will work with later on. Primary shaping is the task, and **FRP** the only tool capable to manage the process.

* Information under "**New Products/New Technology**" is presented in good faith as received from the Author or the sender company, with a view to highlight the latest development(s) in the field. The Editor does not have any means to verify the claims made in it. Interested Readers should ascertain the claims directly with the Author or the company.

Especially during **Production Planning & Control** it is near impossible for common ERP-Systems to schedule the flow of discontinuous production processes which are prevailing in a foundry. The same casting part can be produced with may be different casting techniques; Cores can be produced in-house or purchased, and many services like quality management, fettling and machining can be done either in-house or externally, or even both for the same production order. In addition, the time sequence to create patterns, make cores, print/prepare moulds, prepare the melt charge, pour the molten metal, consider cooling time, shake out processes, further fettling, grinding, machining (optionally) cannot be considered in any 'solution technology' other than **FRP**.

FRP takes care of the whole scheduling process automatically, with the possibility for making adjustments manually. Automated scheduling checks for capacities, and utilisation of specified bottle necks, is able to split lots during production, and takes into consideration the priority of production order and backlog. All foundry processes are administrated on a common platform with the ability to change as and when required, prioritise and ultimately provide that holistic and helicopter like overview of company processes, from inquiry to delivery, through a dedicated **FIS = Foundry Information System** available 24 x 7.

Purchase requisitions for materials and auxiliaries as well as inquiries for externals services are also generated automatically, hence giving the assigned operator full control of the process.

FRP controls in general the following major foundry processes:

- **Foundry Resource Planning** – Cores, Moulding Machine (any type), Melt, Fettling, Machining etc.
- **Tool / Pattern Management** – Its BOM, Usage, Maintenance, Profitability, Rework, Availability Status
- **PPC** – Production scheduling of multiple orders, considering available capacity / bottleneck of ongoing orders
- **Shift / Batch Planning:**Based on Utilization, Material, shifts for all the foundry stages
- **WIP** – Paperless work in progress reporting for each foundry stage, even possible machine integration

Foundry Information System (i.e. FIS) as an online platform (via Mobile, Tab, etc...) to access all the information from inquiry or order to delivery, current status, rejection, casting laying at any stage even external; all available 24 x 7. The whole operation at your fingertip or mouse-click.

Whatever the Cast Alloy or Casting Process, FRP System links ALL foundry processes in one innovative, integrated and standard solution.

This means Foundry Managements have a comprehensive overview of all the processes in the company; while increasing transparency, efficiency and profitability.

If any foundry operation is still facing any of the following problems – **FRP** takes care of it:

- Missing customer deadline for shipment.
- Struggling to get the shop floor data
- Tired of tedious Excel-paper or White-board based planning & scheduling
- Non-productive hours of meetings for the planning, scheduling, delivery
- Unable to collect data from shop floor on shift- / daily- / weekly-basis and in real time
- Impractical or erroneous shop floor data
- Mismatching of Planned v/s. Achieved production data for all the stages – the Buck stops!
- Mismatching reporting before / after scheduling
- and, many more….

So, whatever the cast alloy or casting process, the **FRP** system links ALL foundry processes in **one** innovative, integrated and standard solution. This means foundry managements have a comprehensive overview of all the processes in the company; while increasing transparency, efficiency and profitability.

FRP has been developed with 30+ years' experience in Europe, and used in 300+ facilities and projects. It is now ready for APAC, with **India** at its core destination.

Next Parts of the Article Series will highlight

– How modern foundries should be working using FRP, and how Indian foundries can benefit from these activities
– What foundries face as an obstacle, and why Excel is no solution at all.
– The benefits FRP provides, and how to achieve **Foundry 4.0** in easy steps.
– The outlook to transform the industry into something technically and IT-wise advanced, and make foundries a modern high tech enterprise that's fun to work in, and attract young talent.