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# MaTrEx

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# By: Poach Lab

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Theme: **Digital Twin**

60%

60% of the open skilled production positions in the manufacturing industry are unfulfilled

2–3.5 Million

2 to 3.5 million unfilled manufacturing jobs by the year 2025

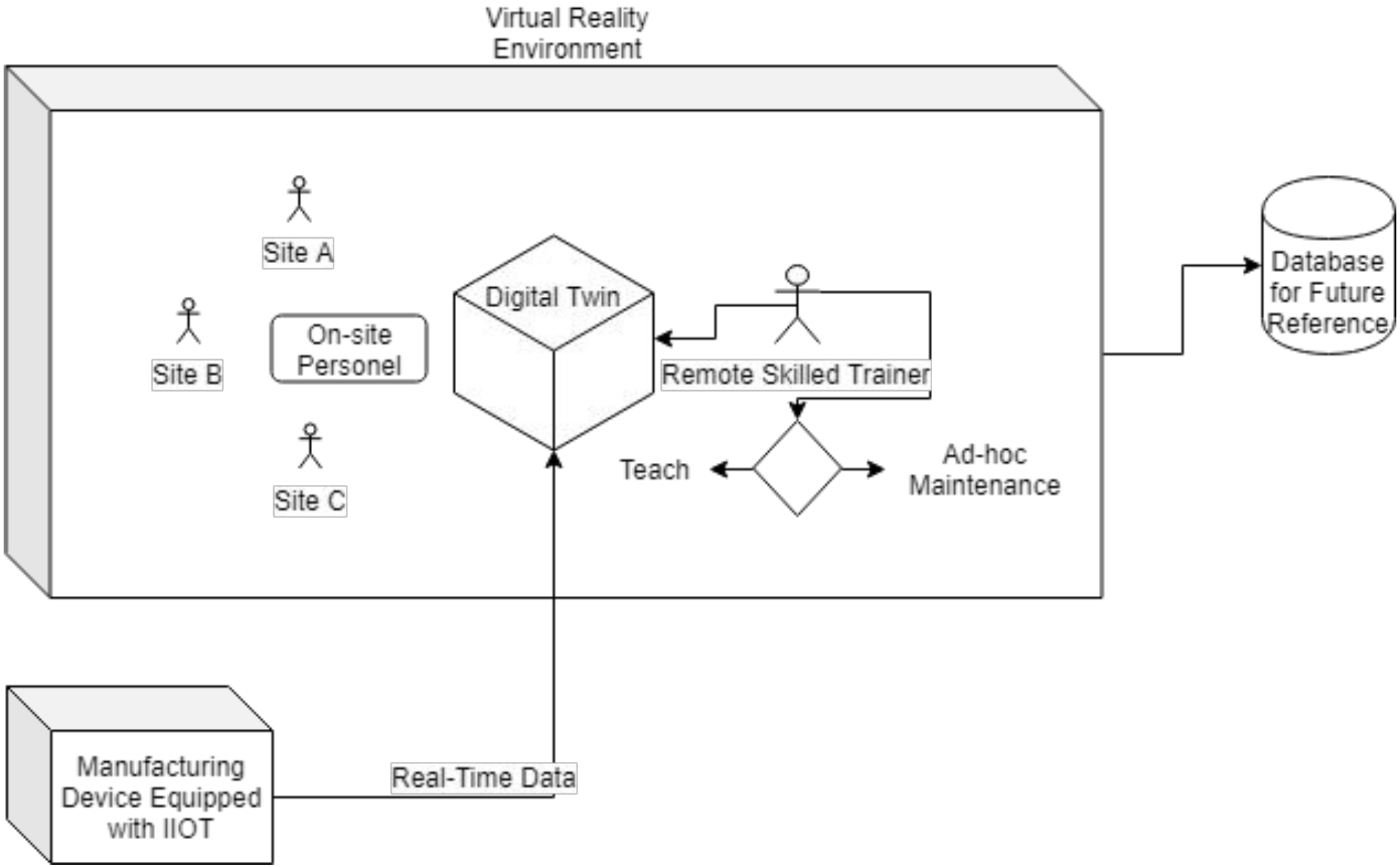
# PROBLEM STATEMENT

Today, **60% of the open skilled production positions in the manufacturing industry are unfulfilled**, with Deloitte claiming that there will be between 2 to 3.5 million unfilled manufacturing jobs by the year 2025. While automation and robotics may help fill the labor gap, **skilled workers will still be needed to apply problem-solving capabilities, perform analysis and manage production**. Manufacturers today need employees with not only a high-tech skill set but also knowledge and working experience with industrial equipment. One reason manufacturers are finding it difficult to fill positions, both skilled and unskilled, is the **lack of trade school opportunities** for young women and men. Add to this an influx of foreign-manufactured equipment which have low on-site skilled personnel to maintain, the downtimes of which can stall the lines for hours and at in extreme cases, even days, **potentially stacking up loses in the scale of millions**.

# SOLUTION OFFERED

## MaTrEx: Maintenance and Training through Extended Reality

We propose development of robust **Virtual Reality training programs,** offering a way for skilled professionals to **train the on-site technicians** and to perform **remote diagnostics** over Virtual Reality, potentially in real time. To achieve this, we make use of **digital twins** - a virtual model of a real machine, so, the professionals can use the immersive effect to, for instance, explode the twin model and either explain it's working or help pinpoint the cause of a malfunction, allowing the professional to **interact with and explain the working of the machine,** thus making it a form of **Assisted Reality powered by Digital Twins**. This will not only provide training opportunities but also provide Ad-hoc maintenance opportunities, using the real time data provided by Industrial Internet of Things (IIOT) devices and a Virtual Database of exception cases for study and training.


Virtual Reality Environment
Site A
Site B
On-site Personel
Site C
Digital Twin
Remote Skilled Trainer
Teach
Ad-hoc Maintenance
Database for Future Reference
Manufacturing Device Equipped with IIOT
Real-Time Data

# Beneficiary

The solution is aimed towards the **Manufacturing industry as a service**. Just in India, the manufacturing sector has the potential to touch **US$ 1 trillion by 2025**. There is potential for the sector to account for **25-30 per cent of the country's GDP** and **create up to 90 million domestic jobs by 2025**. Business conditions in the Indian manufacturing sector continue to remain positive.
The industry is actively looking for innovative solutions of it’s employment problems and would readily invest in XR as a growth opportunity.

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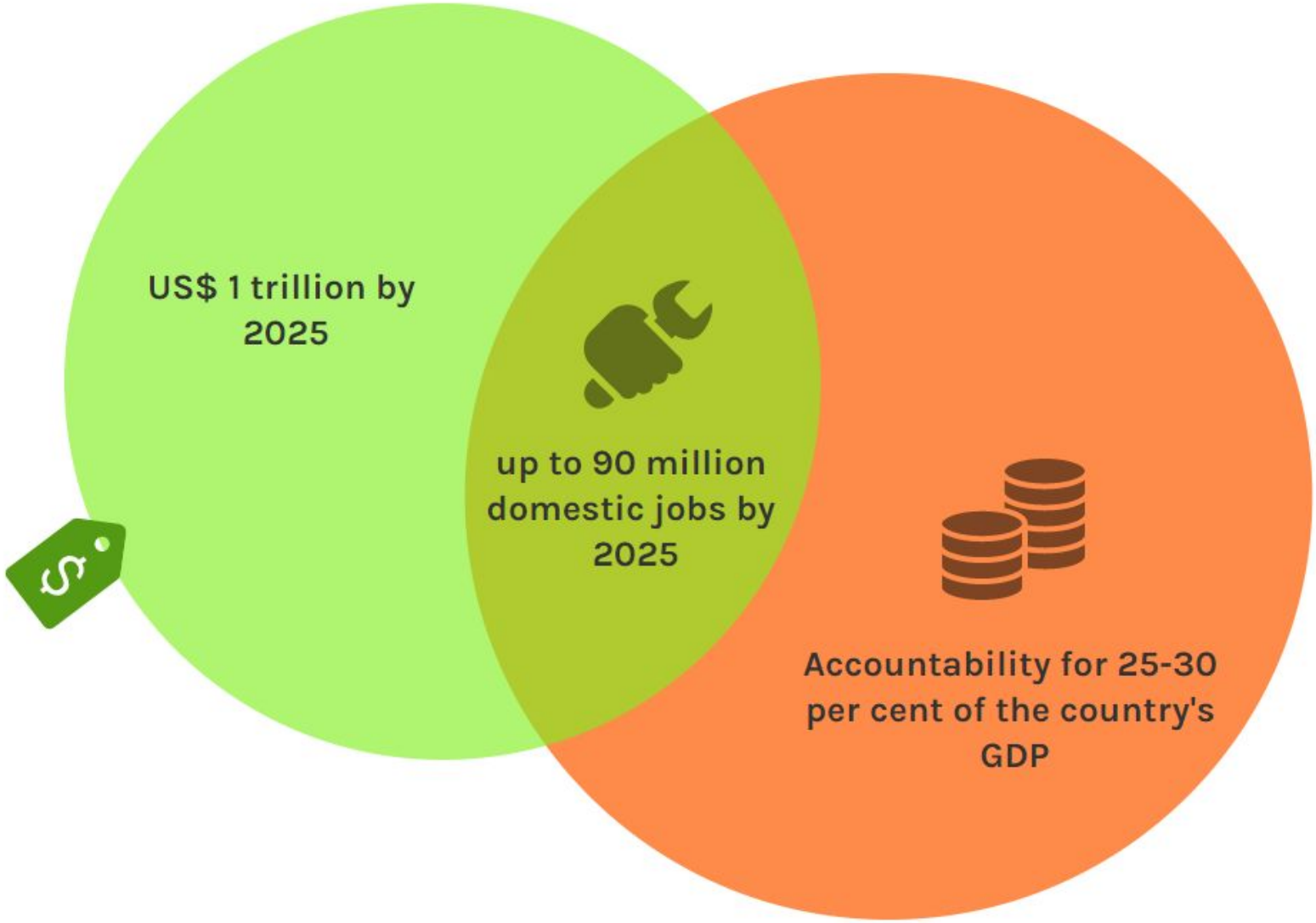

A trained remote Professional can train workers at discrete locations with demonstrations on the Digital Twin
Accenture licences XYZ (Company) MaTrEx
The Manufacturer(s) can make training modules specific for their industry
The technician can then assist on site personnel to and supervise through data from IIOT, drastically reducing downtime and maintenance costs
The Equipment Manufacturers are incentivized in terms of adoptions as more people are trained on their equipment, the more it will dominate the market
In case of Machine Failure, Technicians at various remote locations can use real time streamed data from IIOT to review the problem and frame a solution

# Features of the Solution

- Training of (multiple) on-site workers on potentially different sites by remote professionals. Training in VR provides an effective learning experience by training people in the most realistic way possible, without the situation actually happening in real life.
- Database of these sessions which can be revisited in VR for future reference.One key advantage of VR is that sharing of virtual content can lead to more robust replication and representative sampling. A database of standardized content will allow training of on-site workers more efficiently.
- Ad-hoc maintenance where a remote profession can review the digital twin with real time data and provide guidance to the on-site workers.These sessions can even be recorded for a particular model for future reference and maintenance.
- A Pooling session where multiple professions get access to the digital twin and each follow their approach which is simulated and the optimal solution is implemented.SInce it’s multiplayer, a multiple number of on-site workers can also work on the model or get trained to work with the necessary parts of the model.

## Best Practices Followed

- **Scalable**: Due to the usage of Open VR, the software is made hardware independent which will enable the user to not worry about specific VR hardware.
- **Modular**: The core idea here is reusing as much work as possible by using reusable assets in order to streamline production, save memory and improve load times.
- **Iterative**: The product is easily iterable meaning, we can start with a simple problem and test if it works. If it does, it's scalable and if not, then it's redesignable.
- **Best VR Practices**: The idea here is to use suitable lighting, and providing a great UI/UX experience, so that the user can easily transition into using the product effectively.

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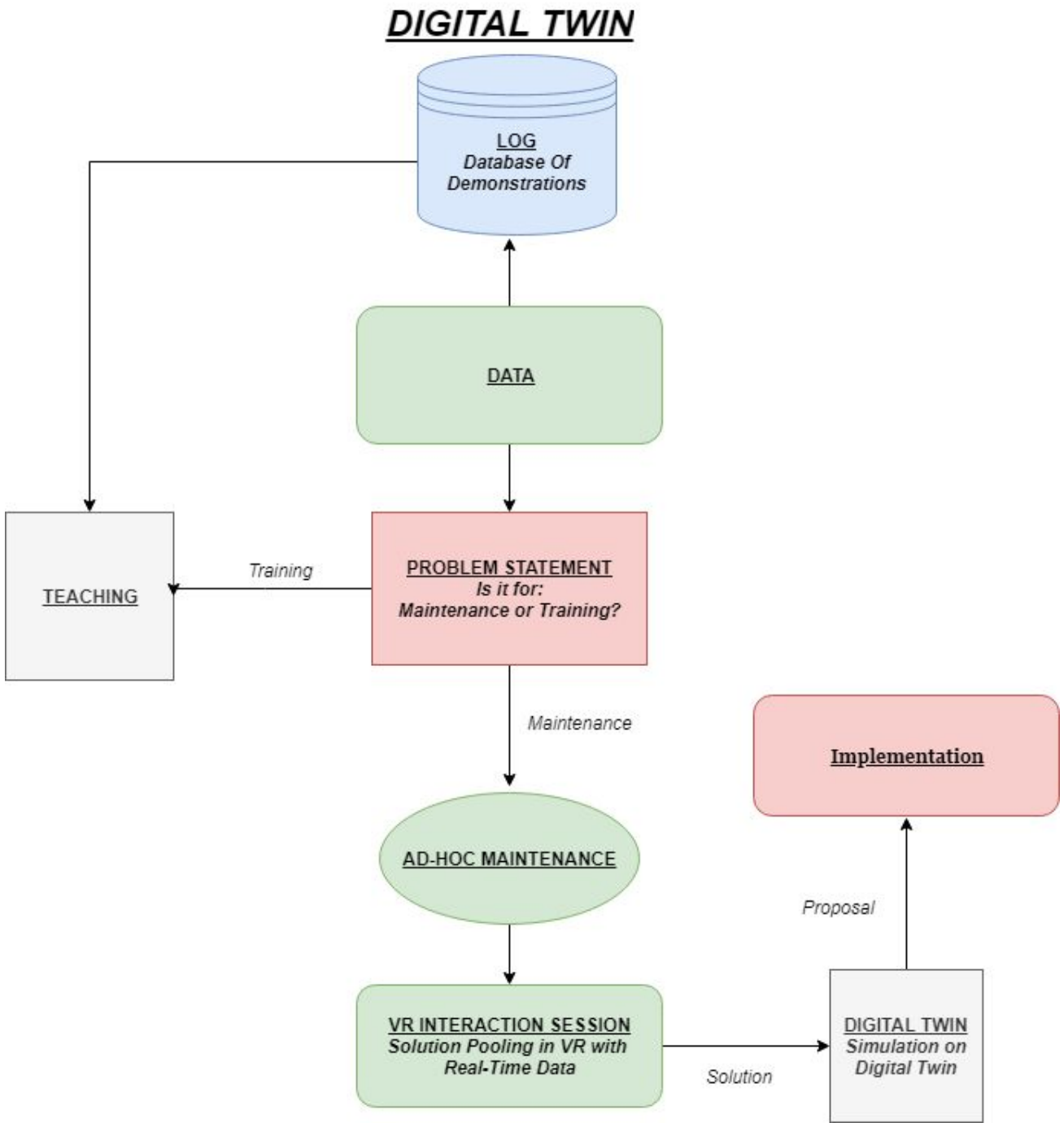
# Process Flow



# Impact

It is no news that core jobs in departments like Mechanical and Electrical Engineering are facing a decline. The influx of engineers are not skilled enough due to lack of exposure while the industry is suffering a heavy lack of skilled workforce.

The solution will not only **Boost Employability**, **Improve Operational Efficiency** but also **Lower Downtimes and Maintenance Obstacles.**

Yes, the solution will have a considerable entrance fee, but this is an investment which will have **returns in the ten folds**.

# XR as a Service (XAAS)

Being modular in nature, the solution can be scaled on an industrial scale. The solution can be **modelled as a Service** which the industries can subscribe to for continual support and packaged at multiple layers based on the generalized needs of the industry.

As an organization providing this solution, there will be continual returns for the services provided. As soon as one industry adopts it, it will trigger a trend which every industry wanting a bite of the pie.

# Thank You!

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