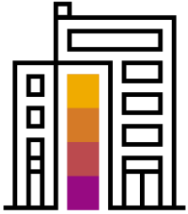




# SAP® Innovation Awards 2020 Entry Pitch Deck

Industry 4.0 Smart Factory in traditional electronic manufacturing enterprise  
Shangqiu Jinzhenyuan Electronic Technology Co., LTD.



## Company Information

|                     |  |
|---------------------|--|
| <b>Headquarters</b> | Shangqiu, China                                      |
| <b>Industry</b>     | High-tech  |
| <b>Web site</b>     | <a href="http://www.hnsxjzy.com">www.hnsxjzy.com</a> |

Founded in 2012, Shangqiu Jinzhenyuan Electronic Technology Co., Ltd. is a professional CNC machine tools and surface treatment oriented precision manufacturing enterprise with R&D, production, sales and service. Its products cover more than 20 categories spanning from consumer electronics, such as smart phones, laptops, etc., to automobiles, sanitary wares, etc. It is the largest private enterprise in Shangqiu region, whose annual tax payment is more than 100 million CNY.

However, in the first five years after its establishment, Jinzhenyuan only produced the frame for the built-in parts of Apple mobile phones, which is the most upstream basic processing part of the entire mobile phone industry chain. Relatively speaking, the technology content is not high and the substitutability is strong. With the dramatic fluctuation of 3C digital industry, the domestic electronic parts manufacturing industry has reached the turning point of change. Facing the transformation and upgrading, Jinzhenyuan must go to the high-end of the industrial value chain and extend the production process downward to integrate seamlessly with the broader downstream industrial chain and improve the core competitiveness. Through successfully implementing the integrated SAP Industry 4.0 Digital Manufacturing solution, Jinzhenyuan successfully realized the intelligent transformation, seamlessly entered the industrial chain of large enterprises such as Huawei and Lenovo, and realized the rapid landing of the intelligent core factory.

# Industry 4.0 Smart Factory in electronic manufacturing

## Shangqiu Jinzhenyuan Electronic Technology Co., LTD.



SAP is the global leader in enterprise management software and solutions. In the long term, SAP system is related to the future development of Jinzhenyuan. The most essential change that SAP system brings to us is the concept and thinking of lean manufacturing and intelligent factory, which has a profound impact.

Huang RunYuan, General Manager of Shangqiu Jinzhenyuan Electronic Technology Co., LTD.

### Challenge

Jinzhenyuan's major product is the most upstream basic processing part of the entire mobile phone industry chain, thus the technology content is not high and the substitutability is strong. Jinzhenyuan has to transform and upgrade to broaden product category and extend production process downward further.

### Solution

Through the implementation of the overall intelligent manufacturing solution with SAP S/4HANA and SAP Manufacturing Suite as the core, integrated with intelligent devices such as AGV, CNC and intelligent robot, Jinzhenyuan realized fully automated, modular production in their core plant.

### Outcome

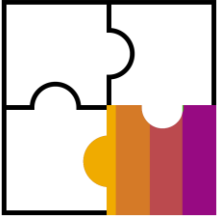
Jinzhenyuan realized the intelligent digital factory with vertical and horizontal integration architecture, and increased the productivity by 32%, decreased the cost by 33%, shortened the cycle from R&D to production by 41%, and became the benchmark of digital transformation in Henan province.



**32%** 32% Increase in productivity

**33%** 33% Decrease in cost

**41%** 41% Shortened the cycle from R&D to production



## Participating Partner Information

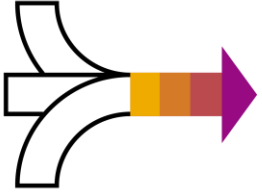
**Foreverwin Electronic and Information Technology Co., Ltd.**

**Primary implementation partner of SAP manufacturing solution for Jinzhenyuan**



Foreverwin is an SAP Digital Manufacturing solution gold partner in Greater China. Within 5 months, Foreverwin implemented SAP S/4HANA to the whole company and SAP Manufacturing Suite to their core smart manufacturing plant with support from SAP Labs China Digital Manufacturing team. They also integrated SAP Manufacturing Suite with the AGV (Automated Guided Vehicle) control system, hundreds of CNC machines and intelligent robot arms through their EAP (Equipment Automation Programing) system to realize fully automated, intelligent modular manufacturing.

**FOREVER WIN**

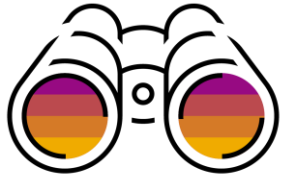


## Business Challenges and Objectives

Jinzhenyuan's major product is the most upstream basic processing part of the entire mobile phone industry chain, thus the technology content is not high and the substitutability is strong. In the first 5 years since establishing, Jinzhenyuan only produced one product dedicated to iPhone. To match the demand of iPhone, it invested more than 2.5 billion CNY on equipment. However, since 2017, along with the sales volume drop of iPhone and the dramatic fluctuation of 3C digital industry, the domestic electronic parts manufacturing industry has reached the turning point of change. Facing the transformation and upgrading, Jinzhenyuan must go to the high-end of the industrial value chain.

In order to be more competent in the industry chain, Jinzhenyuan has to transform and upgrade to:

- broaden product category
- extend production process downward further through the industry chain
- replace intensive labor with automated equipment to reduce cost
- further optimize production process to increase productivity, improve quality and reduce production cycle time
- reengineer shop floor to make production line more flexible to be more responsive to the fast changing market



## Project or Use Case Details

This project realized:

- through the excellent out-of-box integration with SAP ERP system, as well as supporting the integration with various industry standard interfaces, Jinzhenyuan has broken through the barriers from top floor to shop floor, realizing the high-speed integration without redundancy of master data and real-time transparency of shop floor.
- through the horizontal integration of each business system, as well as the deep integration and control into the production lines, SAP manufacturing solution helps Jinzhenyuan realize the independent process control on each piece of product, as well as the push of work instruction and process parameters accordingly. This is also the key concept of Industry 4.0 to produce with LOT size 1, which provides a good foundation for large-scale customized production in the future.
- through the integration of MES and AGV control system, AGV is directed to distribute and transfer materials among various work stations. Through this layout, the production process will not be restricted by the sequential physical location of the production line. The processing flow sequence can be optimized according to the characteristics of each product, and the work stations can be flexibly added or reduced at any time according to the capacity demand, which improves the expansibility and adaptability of the production system, and establishes the rudiment of independent, variable, intelligent and flexible modular production which is the most leading-edge concept of Industry 4.0.
- 14 dashboards and 5 comprehensive reports for users to access at any time to view production efficiency and equipment utilization in real time
- seamlessly integrating into the industrial chains of Huawei, Lenovo and other key customers so as to expand business opportunities for Jinzhenyuan



# Benefits and Outcomes

## Business or Social

- Increased the productivity by 32%
- Decreased the cost by 33%
- Shortened the cycle from R&D to production by 41%
- Increased OEE (Overall Equipment Effectiveness) from 92% to 98.5%
- Improved product defective rate from 3000 DPPM (defective parts per million) to 1500 DPPM
- Increased Utilization rate by 39%

## IT

- Real time visibility is realized through 14 dashboards and 5 comprehensive reports for users to access at any time
- All systems are integrated to avoid information silos and data redundancy and inconsistency

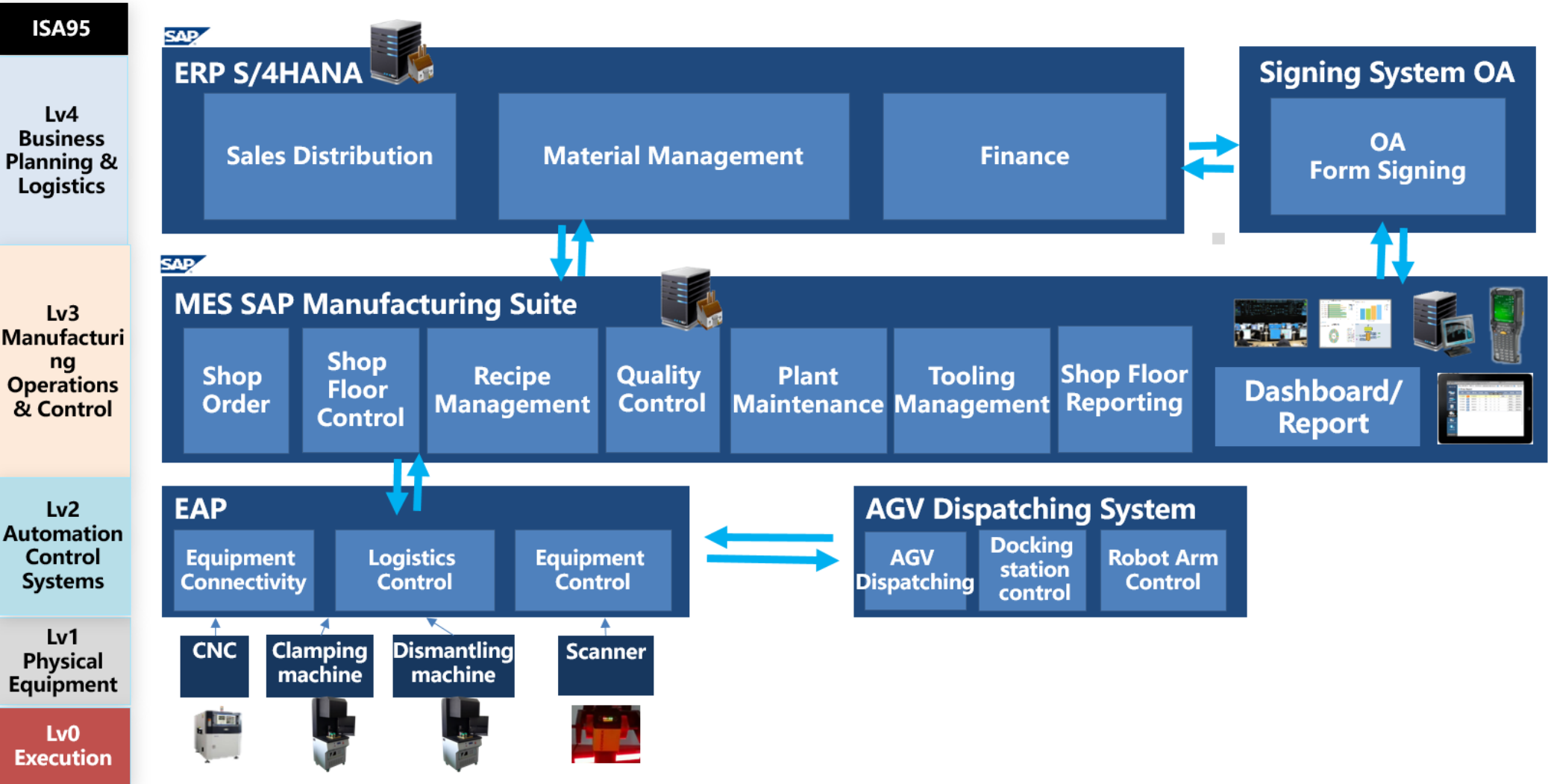
## Human Empowerment

- AGV replaced workers, the direct labor is reduced by 40%, and workers are transfer to more value-added positions





# Architecture







# Deployment

Deployment status      Live

Date                      2019.06.30

Number of users      ~500

## SAP technologies used:

|   | SAP product                                    | Deployment status<br>(live or proof of concept [POC]) | Contribution to project   |
|---|--|---|---|
| 1 | SAP S/4HANA                                    | live  | Takes the role of ERP system to manage enterprise business activities including material management, finance, production, sales distribution, logistics, etc. |
| 2 | SAP Manufacturing Execution                    | live  | Takes the role of MES to manage all production activities in shop floor   |
| 3 | SAP Manufacturing Integration and Intelligence | live  | Integrate SAP ME with S/4HANA, automation control system and other systems and provide real time dashboards and reports                                       |

If you have used one of the services or support offerings from SAP Digital Business Services during the implementation or deployment phase, please select with ☒ one or more of the following offerings:

- ☐ SAP MaxAttention™
- ☐ SAP ActiveAttention™
- ☐ SAP Advanced Deployment
- ☐ SAP Value Assurance
- ☐ SAP Model Company
- ☐ Others:
- ☐ SAP Innovation Services
- ☐ SAP Innovative Business Solutions



# Advanced Technologies

The following **advanced technologies** were part of the project.

| Technology or use case |                            | Yes or No | Contribution to project   |
|------------------------|----------------------------|-----------|---|
| 1                      | 3D printing                |           |   |
| 2                      | Blockchain                 |           |   |
| 3                      | Internet of Things (IoT)   | Y         | Connect MES with AGVs and all shop floor intelligent equipment to realize real time transparency of shop floor and enable MES to control and orchestrate the AGVs and equipments to realize LOT size 1 and modular production |
| 4                      | Machine learning or AI     |           |   |
| 5                      | Conversational AI          |           |   |
| 6                      | Robotic process automation | Y         | Enable MES to control and orchestrate the AGVs and equipments to realize LOT size 1 and modular production  |
| 7                      | Data anonymization         |           |   |

8. Augmented analytics