





Reverse Engineering in Robotic Arm

Scope: Scan and modification of Existing product Application: Production

A robotic arm is a device that function as a human arm using mechanical joints and links. It can be programmed to perform various tasks, such as welding, assembly, painting, or handling objects. Robotic arms are widely used in industries that require speed, accuracy, and consistency. The number and type of joints determine the degrees of freedom and the range of motion of the robotic arm.





MCAD – SoW



SoW:

- Need to scan data from the original product.
- Develop the 3D model of the entire product.
- The base support and arms need to modify.
- Create detail Manufacturing drawing for the modified design.

Original Product :





MCAD – Challenge



Challenge:

- Scan data and develop mesh from the original product.
- Find Perfect Scanner to scan data.
- Generate 3D model from Scanned data for individual parts.
- Modify the changes based on the clients requirements.



Work Outline:







MCAD – 3D Modification

Modification:

- The base support need to change from single side to double side.
- Arm1 & Arm2 have some design change from base comments structure.

For that, the design changes were done by adding following changes to the original design of every part.

- Create variables
- Create Configuration
- Suppress and Unsuppressed the feature for reduce the time of work

| | Configuration Properties | ? |
|---|--|----------|
| | ✓ × | |
| | Configuration Properties | ~ |
| 2 | Configuration name: | |
| - | Version-02 | |
| | Description: | |
| | Base, Arm1, Arm2 upgrade | |
| | Use in bill of materials | |
| e | Comment: | |
| | | <u>^</u> |
| | | ~ |
| | Custom Properties | |
| | Bill of Materials Options | ~ |
| | Part number displayed when used in a bill of materials: | |
| | robot arm | |
| | Document Name | \sim |
| | Child component display when used as a | |
| | subassembly: | |
| | © show | |
| | Hide | |
| | () Promote | |

Advanced Options

😘 arm 2 (Default<<Default> Display Sta History 🗳 arm 1 (Ver02<<Default>_Display State History Sensors Annotations Sensors Wase (Two Support << Default>_Displa Annotations Solid Bodies(1) History Material < not specified> Solid Bodies(1) 🚟 Material < not specifie Front Plane Sensors Top Plane Front Plane Annotations Right Plane Di Top Plane Solid Bodies(1) 🚺 Right Plane L. Origin Equations Boss-Extrude1 1. Origin 🚰 Material < not specified> D Plane1 Boss-Extrude1 Boss-Extrude7 Image: Cut-Extrude1 Front Plane Boss-Extrude2 Image: Cut-Extrude2 Top Plane Chamfer1 Boss-Extrude2 🚺 Right Plane 🕥 Fillet1 Cut-Extrude3 L Origin Boss-Extrude3 Cut-Extrude4 Boss-Extrude1 Image: Cut-Extrude5 Cut-Extrude1 Cut-Extrude2 M10x1.25 Tapped Hol Boss-Extrude2 🛱 CirPattern1 Ed CirPattern1 Fillet1 Cut-Extrude3 Sketch10 Cut-Extrude2 Plane2 M10x1.25 Tapped Hol Cut-Extrude1{ ->?} ₽ GirPattern2 Boss-Extrude4 Fillet2 Boss-Extrude9 Boss-Extrude3 Boss-Extrude8 Fillet1 Cut-Extrude3 Boss-Extrude5 Chamfer1 Cut-Extrude4 Chamfer2 Boss-Extrude4 Cut-Extrude5 Boss-Extrude6 D Plane1 Cut-Extrude6->? Chamfer3 Delane2 Fillet2 Cut-Extrude7 Extrude-Thin1 Chamfer4 Mirror1 Image: Cut-Extrude8{ ->?} 📝 Axis1 Plane3 Fillet3 Mirror4 Fillet4









Original Product:





Modified final Product:









A Heartfelt Customer's Voice

As we missed the original 3D design data of our Industrial 6-axis robotic arm, we approach them to develop the model from scanned 3D data by reverse engineering, with some additional changes to the original product. The 3D model they created was the exact match for the product. They done the model on time along with modifications and manufacturing drawings. As an additional feature they suggest the another Electric Servo Motor that matchs the existing performance with low cost.





Conclusion

- In this project, we need design from the existing product makes it more interesting. We overcome the problem with the help of deep research & knowledge in CAD and reverse engineering.
- We create the exact 3D as the reference for them and modify the product as ideal for applications requiring long reach, 6 axis and efficient product.
- We proudly present a meticulously crafted 3D that has garnered the resounding approval of our esteemed clients, marking a significant milestone in our journey.

