

The Objective:

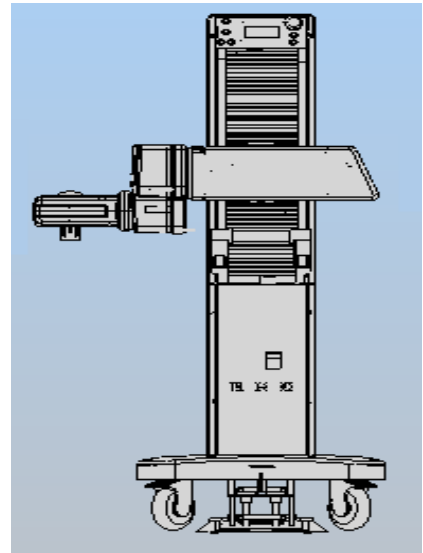
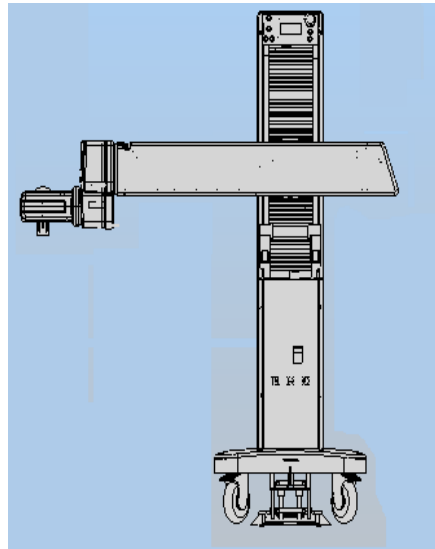
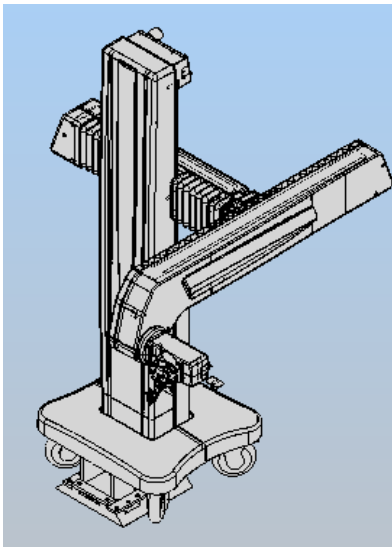
A medical equipment manufacturer was developing a multi axis positioned to interface with an MRI system to facilitate quick physical location of a point of interest identified on a patient's body during the imaging. The existing sub system was deflecting more than the desired tolerance level. The system was huge and operation has less repeatability. Customer wanted us to redesign the same.

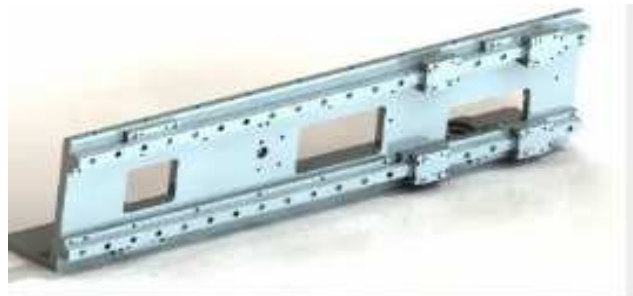
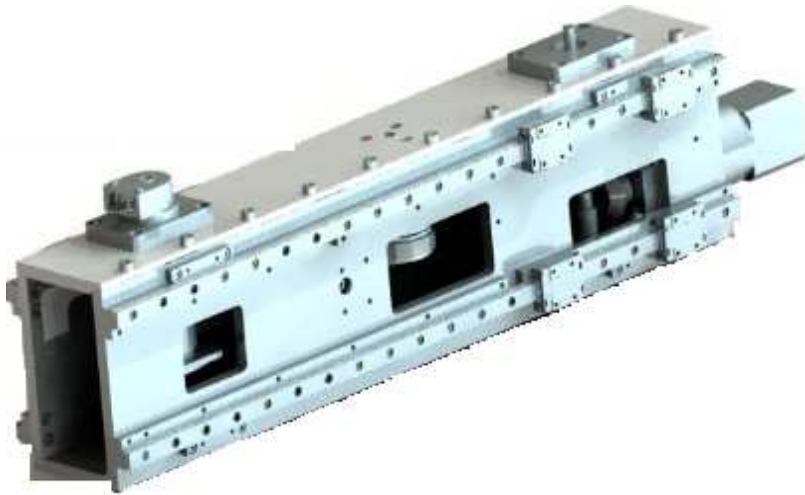
The Challenges:

Old sub system's deflection (measured at the end effectors) specification was 250 micron at 5kg for a stroke of 500mm. For the new sub system the retracted length of the sub system had to be 600mm, while the extended length had to be 1100mm. The repeatability specification was sub 100 micron.

The Solution:

We used of two LM Rails, along with the structural design helped in reducing the deflection to a great extent. The old design used a ball screw whereas the new design used two rack and pinions to allow the shrinking of the sub system as per the requirements. To meet the repeatability specification and to handle backlash, constant tension springs with electrical brakes were used.





The Outcome:

Trials have been conducted at NextFirst and all specifications are being met. The sub system will be incorporated into the next version of the product.