



MINISTRY OF DEVELOPMENT OF
NORTH EASTERN REGION



Prime Minister's
Development Initiative
for North East Region
(PM-DevINE)

Digital Design and 3D Printing Center of Excellence in the Electronic Manufacturing Cluster (EMC) in collaboration with other Government Agencies located at Tech City, Guwahati

3D Scanning of Spare Parts





Innovations Using Digital Designing & 3D Printing At Assam University, Silchar





Innovations Using Digital Designing & 3D Printing At Assam University, Silchar

Jackfruit Peeling Machine

Digitally designed and prototyped using 3D printing for safe, hygienic, and fast jackfruit peeling.

Mentored by **3DP CoE** Portable and cost-effective



PROBLEM STATEMENT

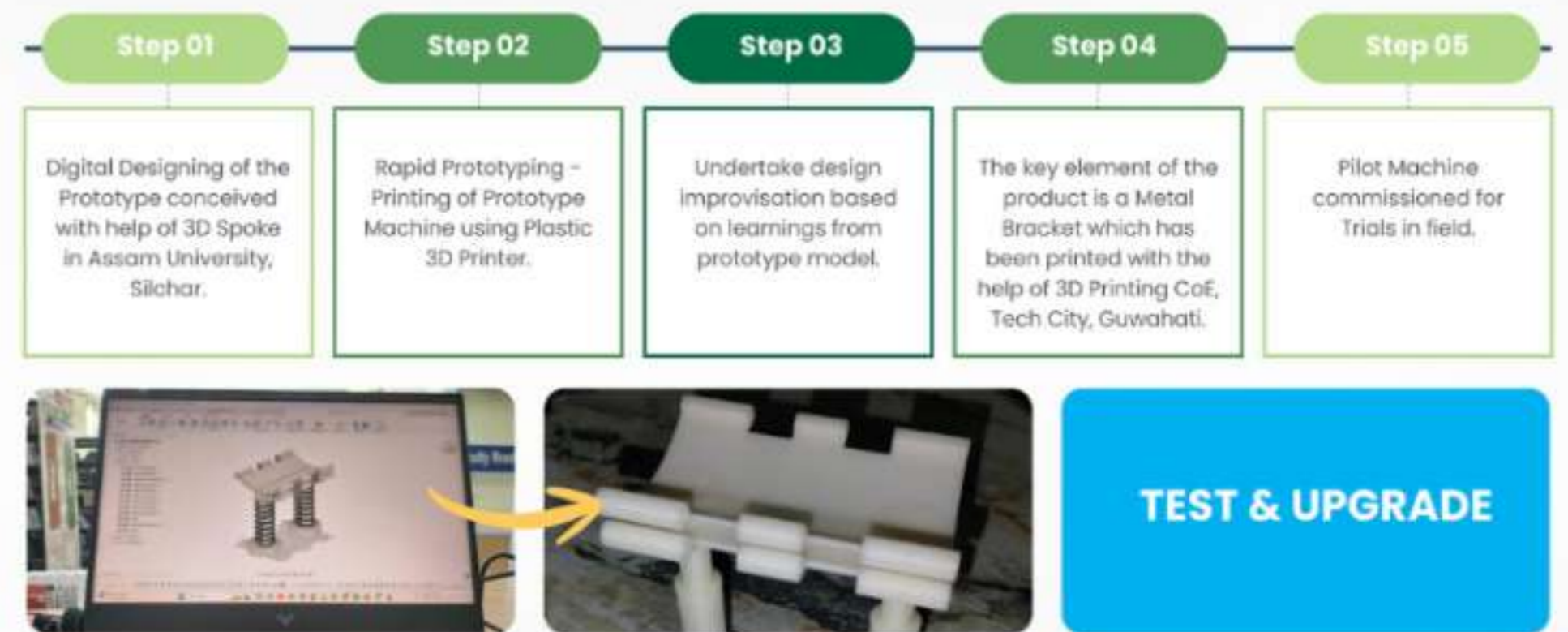
- Jackfruit peeling is primarily difficult due to its massive size, thick, spiky skin, and the excessive, sticky white latex (resin) it oozes, which is hard to remove from hands and tools. The sticky residue requires lubrication of knives and hands with oil for management.
- It also presents environmental waste challenges, as 50% of the fruit is discarded in the peeling process.



SOLUTION PROPOSED

- To Digitally Design and Prototype using 3D Printing, a jackfruit peeling machine which is portable and cost effective.
- Allows safe and fast peeling of jackfruit as well ensure hygiene of peeling process.
- To evaluate the performance of developed machine.

STEPS OF PRODUCT DEVELOPMENT WITH MENTORING FROM 3DP COE



COMPONENTS

- Alloy Steel for stand and handle.
- Stainless Steel for concave plate & blade.
- FDM plastic or Stainless steel, for shelf.
- Ball bearing, for smooth movement and rotation.



Stand & Handle of alloy steel



Concave plate of Stainless steel



Shelf of FDM plastic



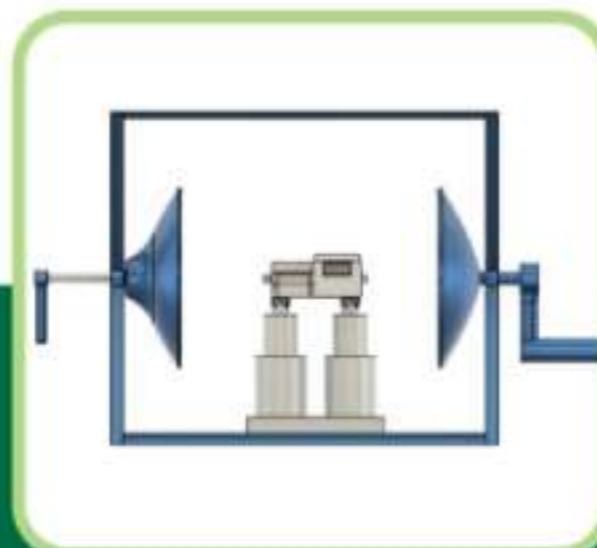
Methodology Adopted To Make The Product

- Torque required for Hand Operation**
Torque = force applied on handle x radius of handle
- Peeling force calculation**
Peeling force = Contact area between blade & skin / skin shear strength
- Overall performance Index (OPI)**
OPI = (Peeling efficiency) x (Throughput) / Machine time

DESIGN – PART I



Frontview of Jackfruit Peeling Machine



Overall view of Jackfruit Peeling Machine

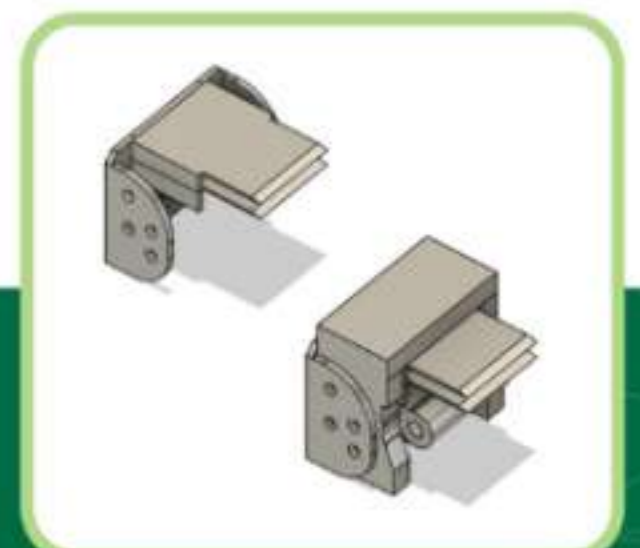
DESIGN – PART II



Shelf and Blade assembly



Assembly without Blade holder



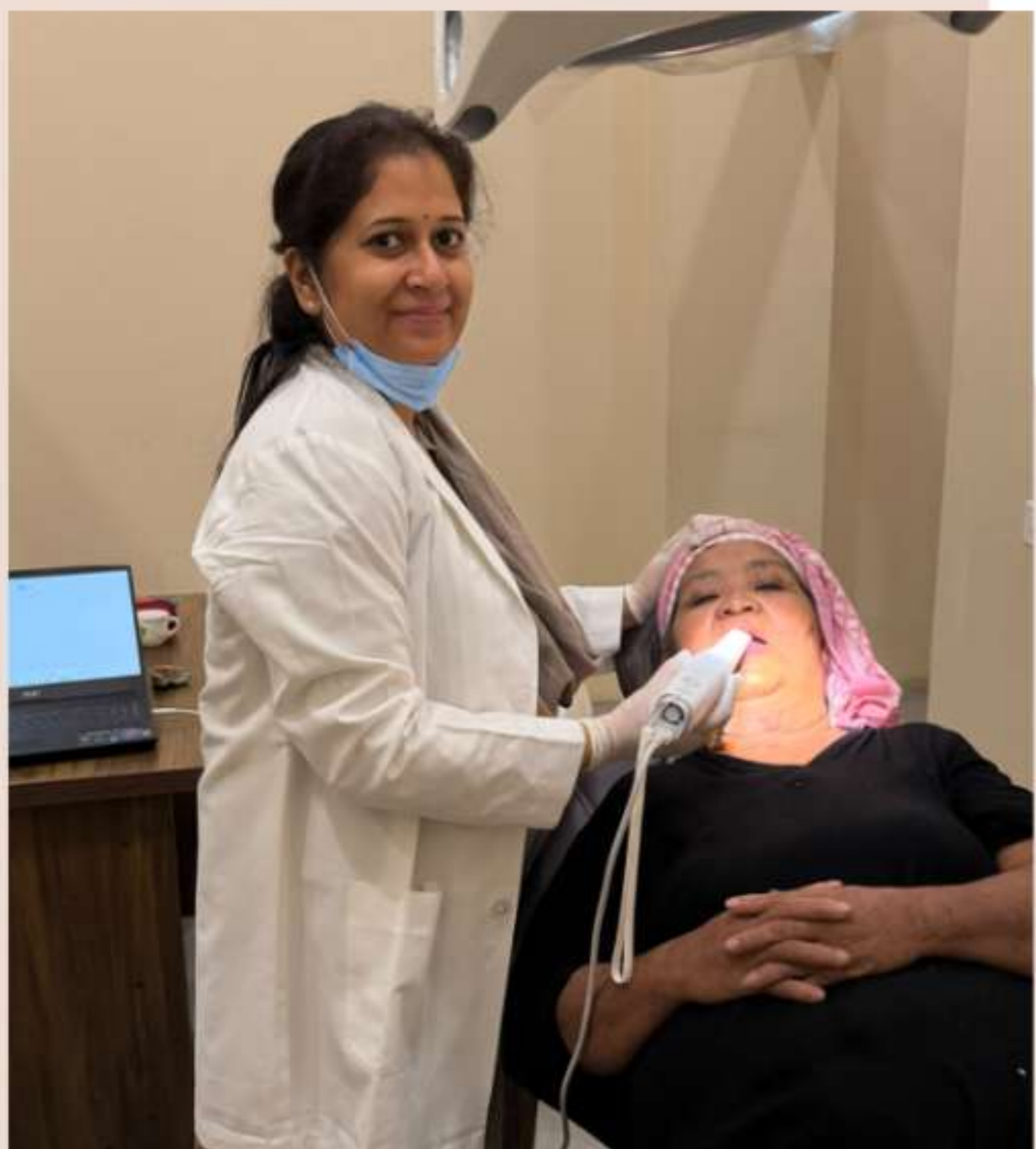
Assembly with blade holder



Visit by Officers of Assam Rifles



Digital Dentistry Demo with Indian Army

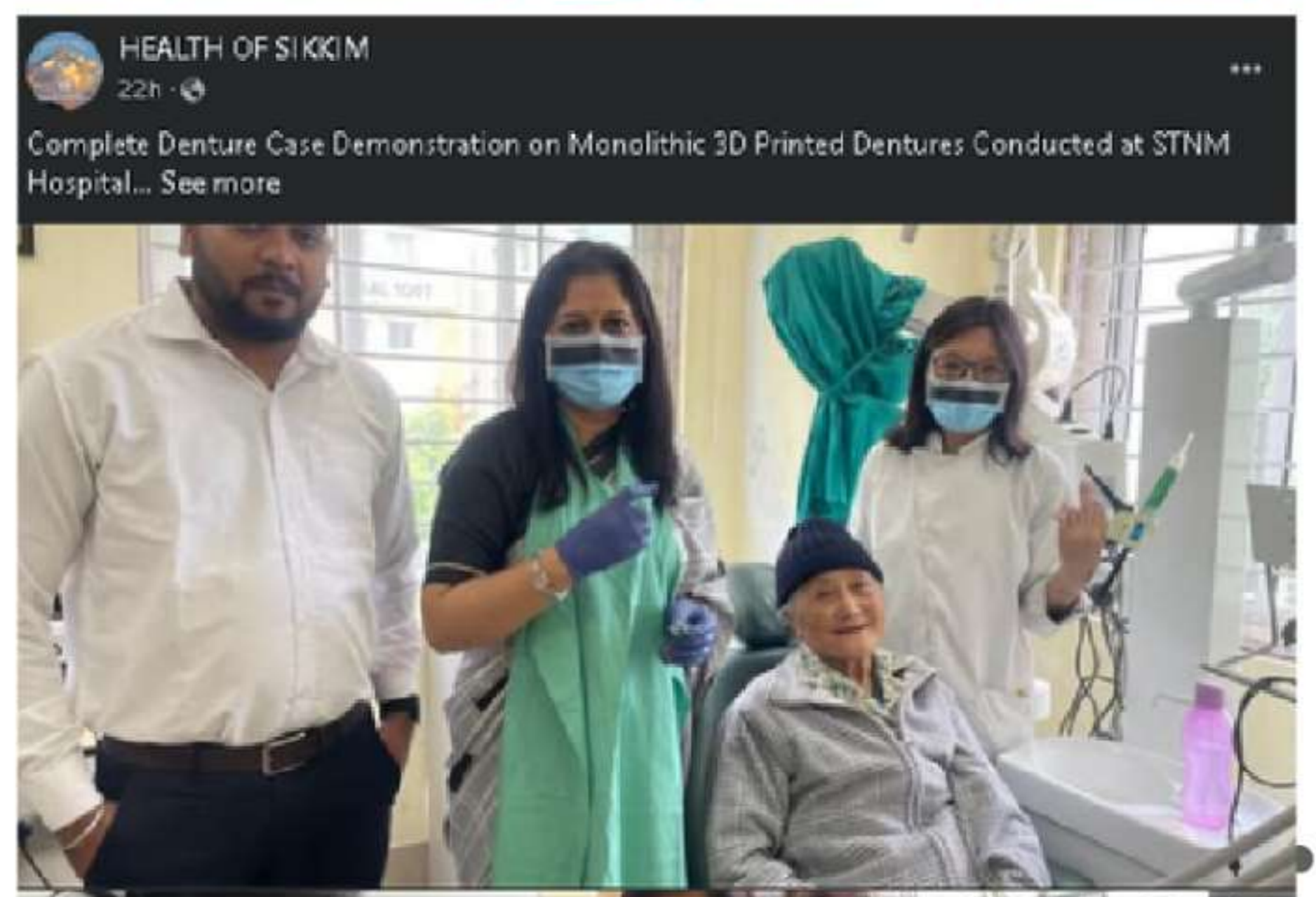


Digital Dentistry Workshop Silchar, Assam





Digital Dentistry Workshop Gangtok, Sikkim





Workshop on Digital Design and 3D Printing Technology for Students of Ramanuj College and Gurucharan University at 3DP Spoke, Assam University, Silchar



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