melbu | More Entrepreneurial Life at Bangladeshi Universities

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Outlines

In this workshop we will discuss:

- ❑ **Prototype**- What is it
- ❑ **Need for a Prototype**
- ❑ **Different forms** to demonstrate product idea
- ❑ Prototype development **Tools**
- ❑ **Create a simple prototype** of business idea

Helpful to visualize and present business/technology ideas

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Agenda

1. Prototype – What is it?
2. Different types
3. Helpful Tools
4. Practical example with case studies

What is a prototype?

A prototype is a **functional**, not final version of a product or service that businesses can **use for testing, to solicit feedback, and to introduce to investors** before officially launching to a wider market.

Prototypes are used to

- ❑ determine whether a design will work or not?
- ❑ make any necessary adjustments before spending valuable budget on mass production

Why prototype?

It helps the user to

1. Build a user **friendly product**
2. Understand the **further problems**
3. Save **money and time**
4. Maximizing **manpower**
5. helps **convince investors or stakeholders**
6. Cross functional **team collaboration**

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What prototype offers?

= conversion of ideas into **paper, digital, physical** form.

= **first example** of something from which all later versions are developed and lead to a final version

= used to present **performance**, and test **feasibility**

= enables **testing** a concept and **learning** from it

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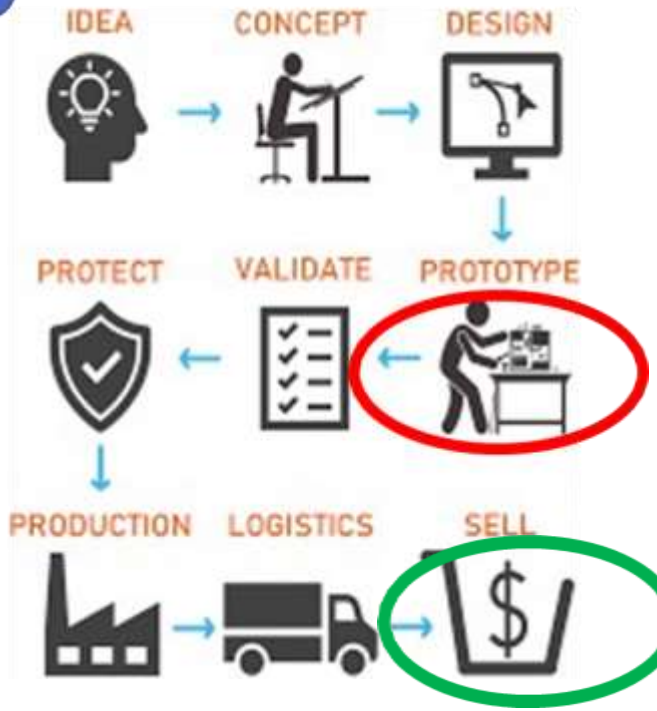
Innovation process prototype



demo version
prototype

final version
product

Source

Example

Early Version
(Prototype)

Final Version
(Product)

Why do we need prototype for

One can successfully sell something
When others can see / touch / test the product

1. To develop a **team** to **visualize** an initial concept

2. To **test** the product's new features by **client**

3. To **fundraise** money for business by **investor**

Why do we need prototype for

1. **visualize** ⇨ **Team**
2. **test** ⇨ **Client**
3. **fundraise** ⇨ **Investor**

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Factors need to be considered in prototyping

1. Sending Native CAD
2. Multiple Shells or Unshared Edges
3. Verifying the Unit of Measurement
4. Designing for the Process
5. Choosing Price over Process
6. Detail instructions
7. Small Features/Thin walls
8. Tolerance Variance
9. Application Consideration
10. Rushing the Results

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Prototype Example

1. Paper prototype

Created in form of **hand sketched drawing**

Prototype Example

1. Paper prototype

Created in form of **hand sketched drawing** (using sticky notes and paper)

2. Digital prototype

A virtual model of the product is created to see the working of individual components (using graphic programs like CAD)

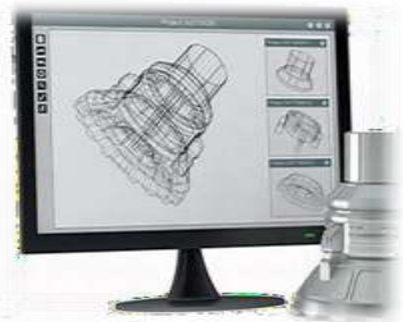
3. Physical prototype

Enables verification of shape, mechanics, and performance testing in form or a **physical model** (3D print, etc.).

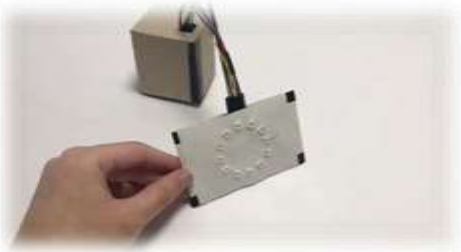
Prototype Example

Paper Prototype

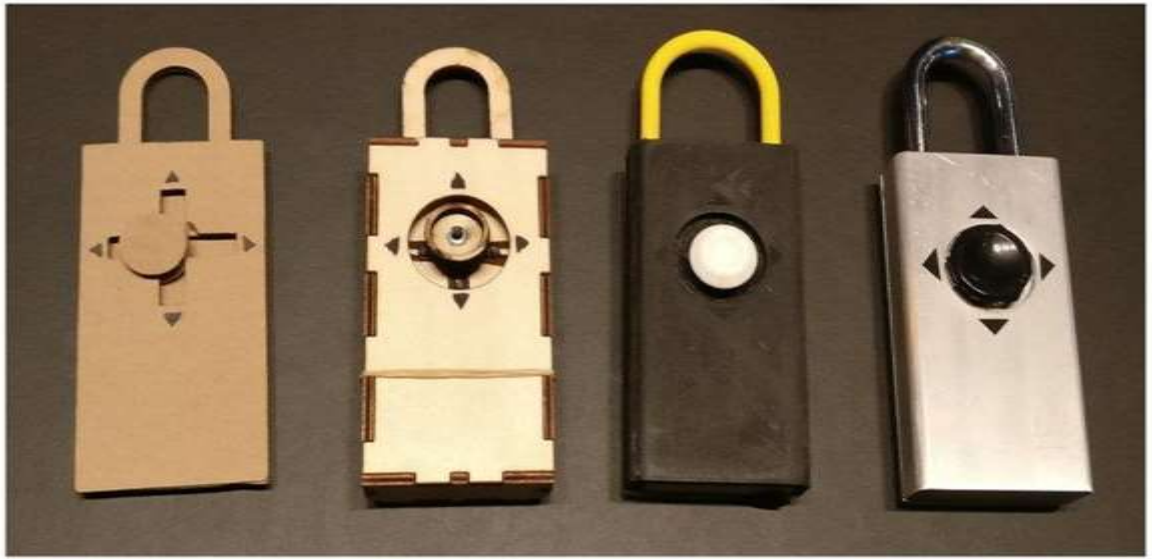
Digital Prototype



Physical Prototype



Prototype Example



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Steps on Prototype development

Steps on Prototype development

1st

Create product backlog

Key components
(What it should consist of?)

Key functionalities
(What it should do?)

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Steps on Prototype development

1st

Create product backlog

Key components (What it should consist of?)

Key functionalities (What it should do?)

2nd

Creation of first basic concept

First vision (drawings)

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Steps on Prototype development

1st

Create product backlog

Key components
(What it should consist of?)

Key functionalities
(What it should do?)

2nd

Creation of first basic concept

First vision (drawings)

3rd

Creation of first Physical version

Based on client requirements (Must-Have)

Alpha version

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Steps on Prototype development

1st	2nd	3rd	4th
Create product backlog	**Creation of first basic concept**	**Creation of first Physical version**	**Prototype redevelopment**
Key components (What it should consist of?)	*First vision (drawings)*	*Based on client requirements (Must-Have)*	*Until it becomes the archetype of the final product*
Key functionalities (What it should do?)		*Alpha version*	*Beta Version*
			Gamma version
			…

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Steps on Prototyping process

- Create **the first visual impression** of the products asap (sketch)

- Develop **a basic prototype** (if someone has resources) to interact with client
- Find first **clients** and test the developed prototype

- These findings will help the owner to **validate** Must-Haves / Must-Does / Could-Have / Could-Does
- **Redevelop** and repeat the same process as many times as necessary

- Try to **commercially validate** the prototype with one client (Pilot Project / Test)
- Finally, decide to create a **product variations** (basic, advanced, …)

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Digital Prototyping

- ❑ Creating a **real world model** of our products
- ❑ Creating a functional model of the product before **actual development**
- ❑ It is created **digitally** with all needful animation and transition

Several **digital prototyping** tools are available

These are

1. Wondershare mockitt
2. Io
3. Sketch
4. Framer etc.

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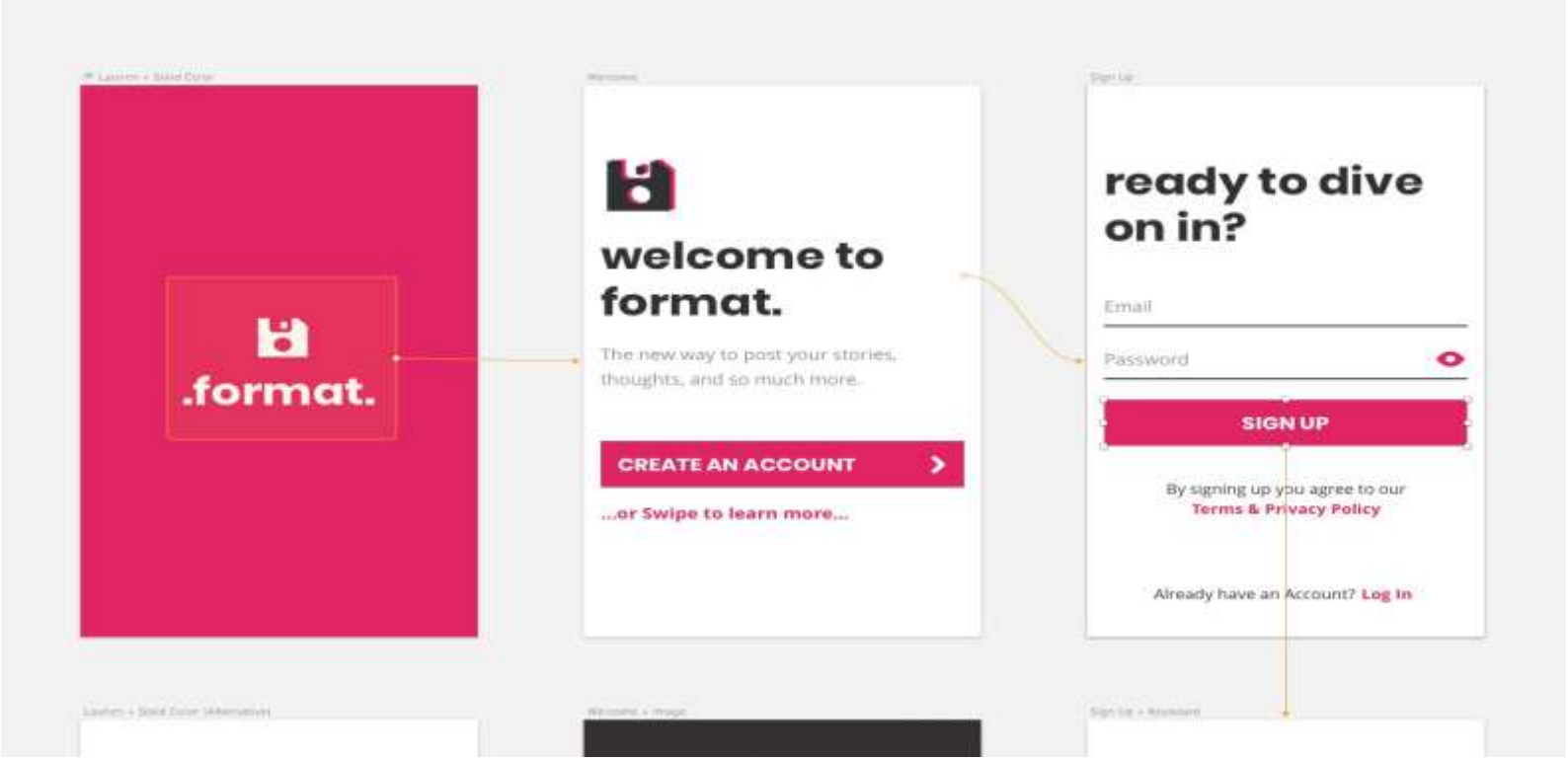
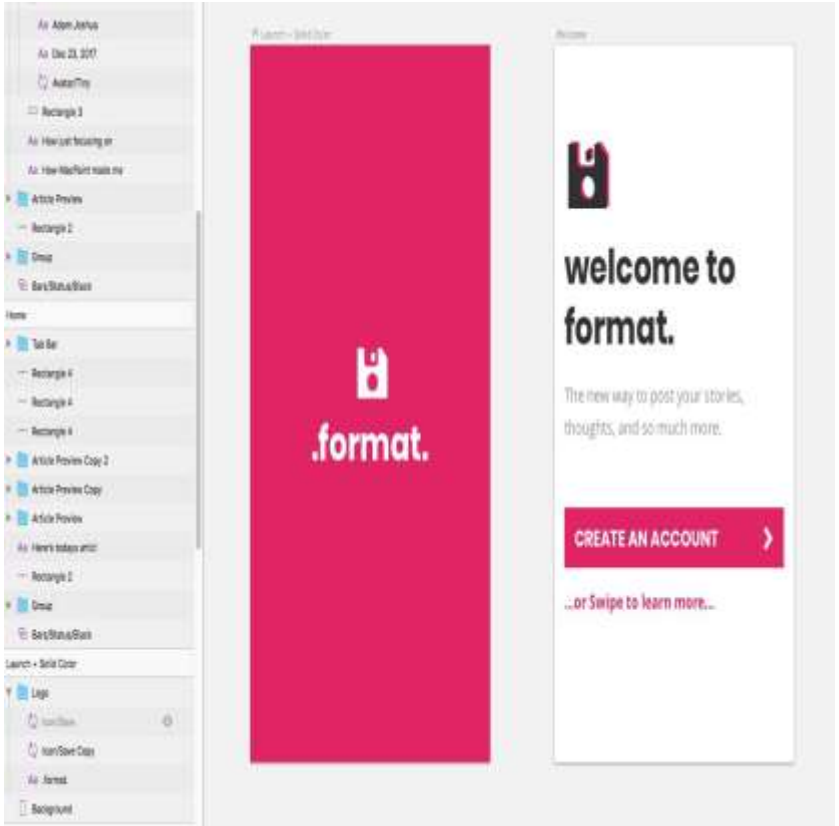
Sketch (Prototyping software)



Sketch (features)



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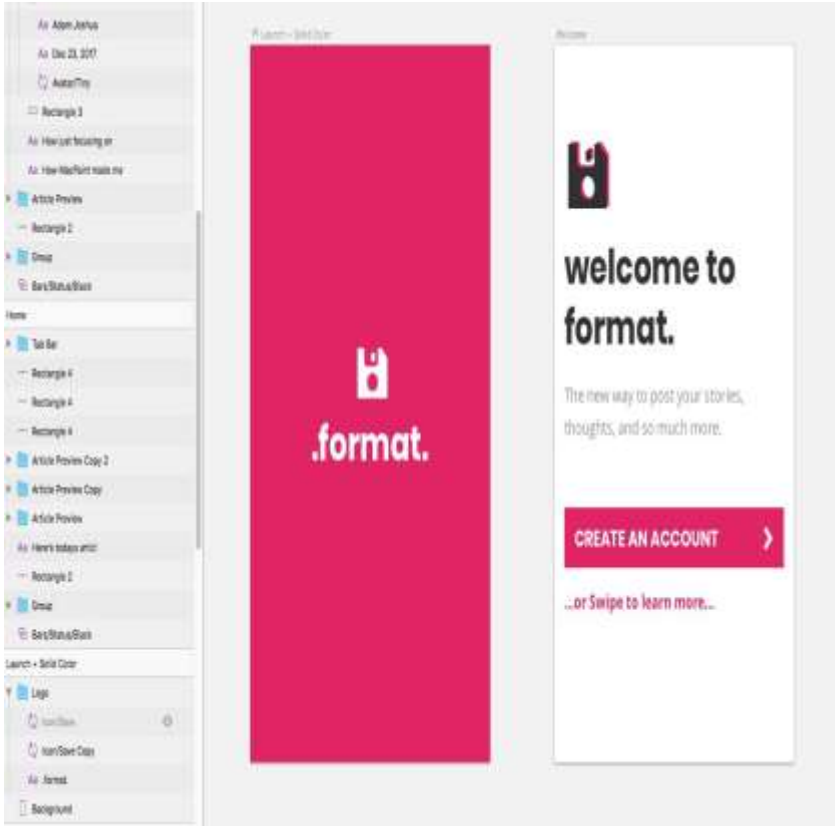
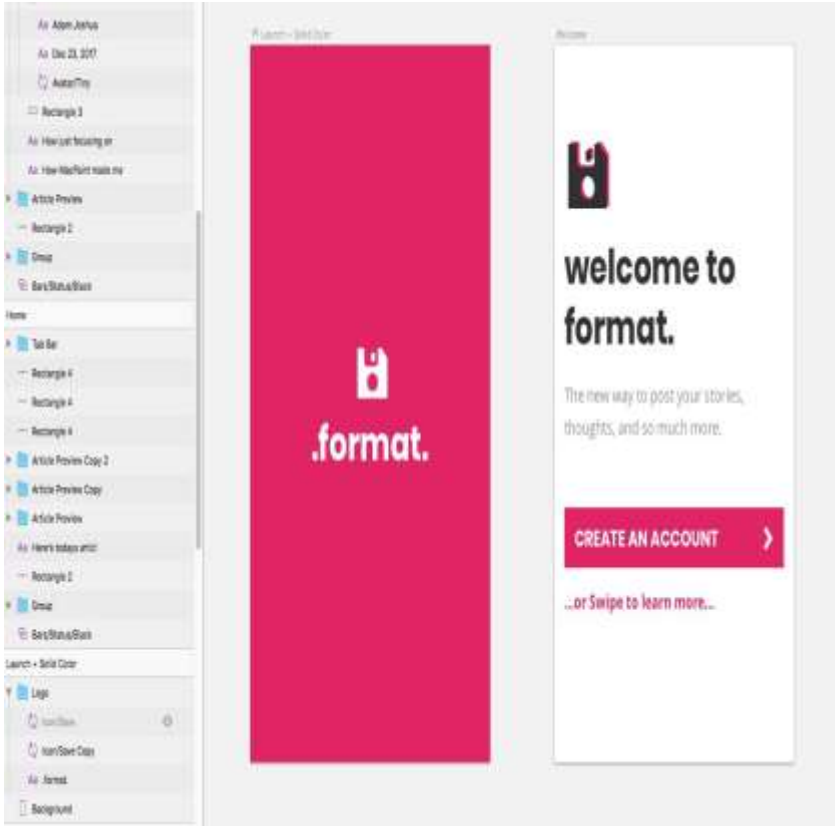
Sketch (features)

- Add different layers on prototypes to test the UI from all perspectives.



Sketch (features)

- Add different layers on prototypes to test the UI from all perspectives.
- Include any vector from its library or create new designs from scratch



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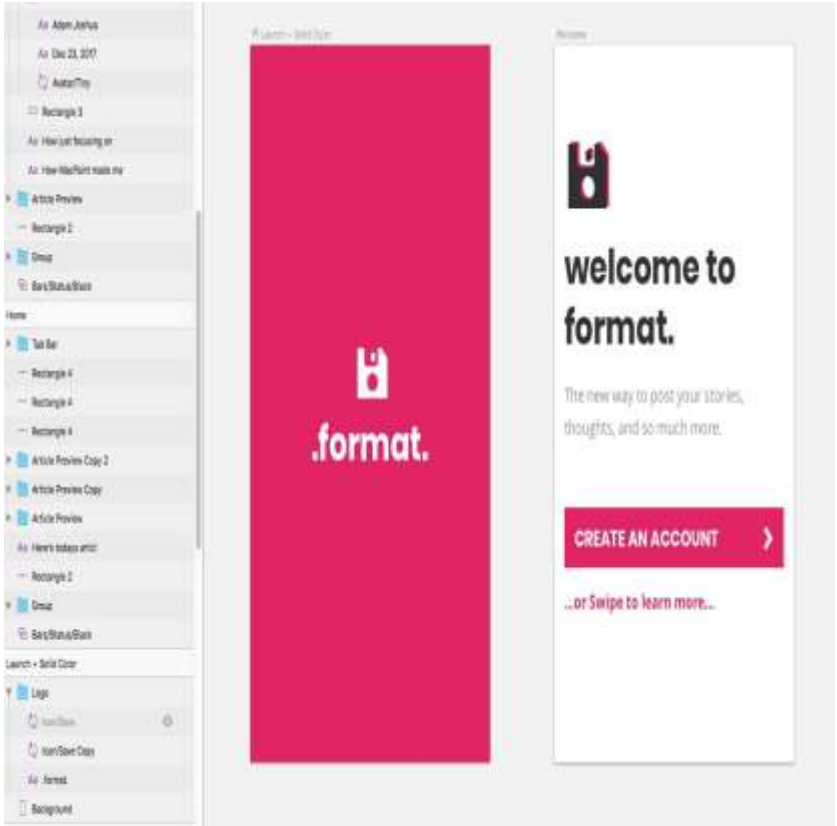
Sketch (features)

- ❑ Add different layers on prototypes to test the UI from all perspectives.
- ❑ Include any vector from its library or create new designs from scratch
- ❑ Works on scalable design



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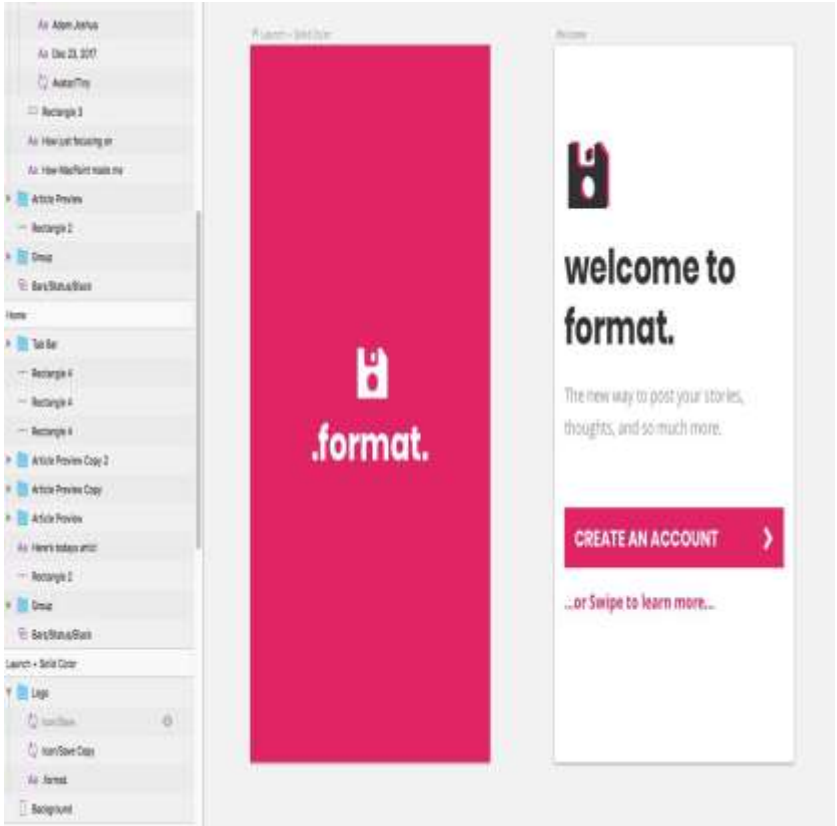
Sketch (features)

- Add different layers on prototypes to test the UI from all perspectives.
- Include any vector from its library or create new designs from scratch
- Works on scalable design
- Integrating it with its cloud to collaborate with the team



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Pros and cons of Sketch

- Pros

Pros and cons of Sketch

- Pros

1. Offers tons of template and vectors

Pros and cons of Sketch

- Pros

1. Offers tons of template and vectors
2. Extensive designing features

Pros and cons of Sketch

- Pros

1. Offers tons of template and vectors
2. Extensive designing features

- Cons

Pros and cons of Sketch

❑ Pros

1. Offers tons of template and vectors
2. Extensive designing features

❑ Cons

1. Only runs on mac

Pros and cons of Sketch

❑ Pros

1. Offers tons of template and vectors
2. Extensive designing features

❑ Cons

1. Only runs on mac
2. Bit complicated for beginner's

Digital tools for prototype developmen

1. 3D Printer
2. CNC Machine
3. LASER Cutter
4. PCB Machine

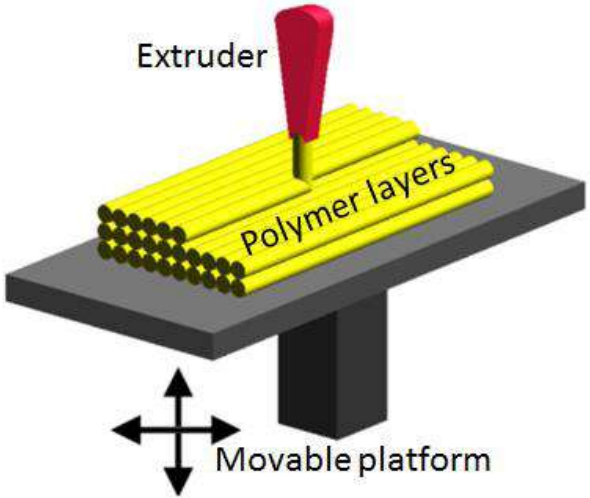
Three Dimensional (3D) Printing

What is 3D printing?

A process used to fabricate three-dimensional objects based on the digitally controlled deposition of successive layers of material until a final structure is created.

Why 3D printing?

- Complexity of the objects to be created
- Material employed
- Number of replicates needed
- Labor and
- Cost



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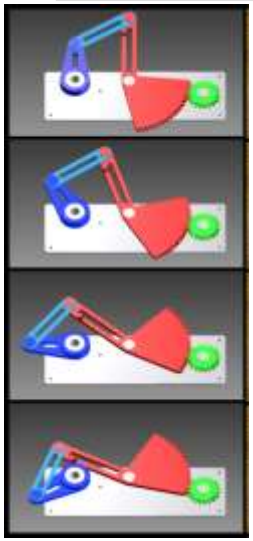
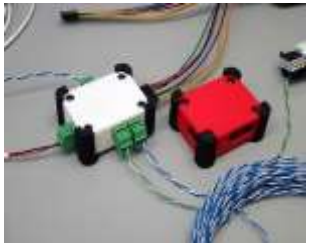
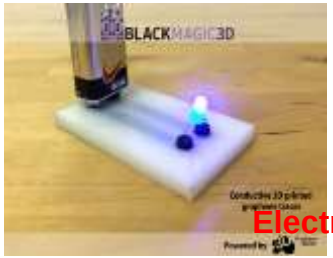
Who are using it?

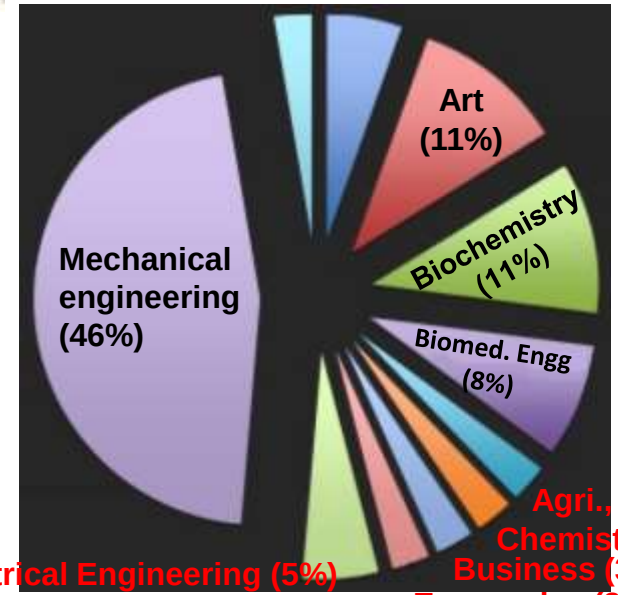




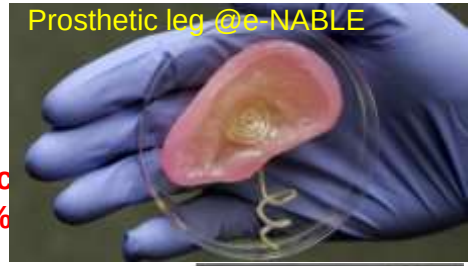


Natural Resource & Env. Sci (3%)

Anthropology (5%)



Agri., Biotec
Chemistry (3%
Business (3%)
Economics (3%)
Electrical Engineering (5%)



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Material selection: ABS, PLA or Others?

ABS (Acrylonitrile Butadiene Styrene): well-known thermoplastic in injection molding industry. TS = 27 MPa, MP=N/A (amorphos) typically above 190 ºC
PLA (Polylactic Acid): thermoplastic derived from renewable resources. TS = 37 MPa, MP=173 ºC

Available in filament form: dia = 1.75 or 2.85±0.05 mm

Special filaments

PETG: PET and PETG, ease of printability, smooth surface finish, and water resistance.
Flexible: TPE or TPU
HIPS: Dissolvable support structure
Bendlay: ABS based optically transparent
Nylon: Tough and semi-flexible material>high impact and abrasion resistance.
Carbon Fiber Filled: PLA or ABS base material>increase strength and stiffness.
Others….Polycarbonate, Polypropylene, Metal Filled, Wood Filled, PVA, CNT, Graphene, Porous, Fluorescence....“Food”….”Living cells”…

ABS/PLA price:
~ 5000 per kg

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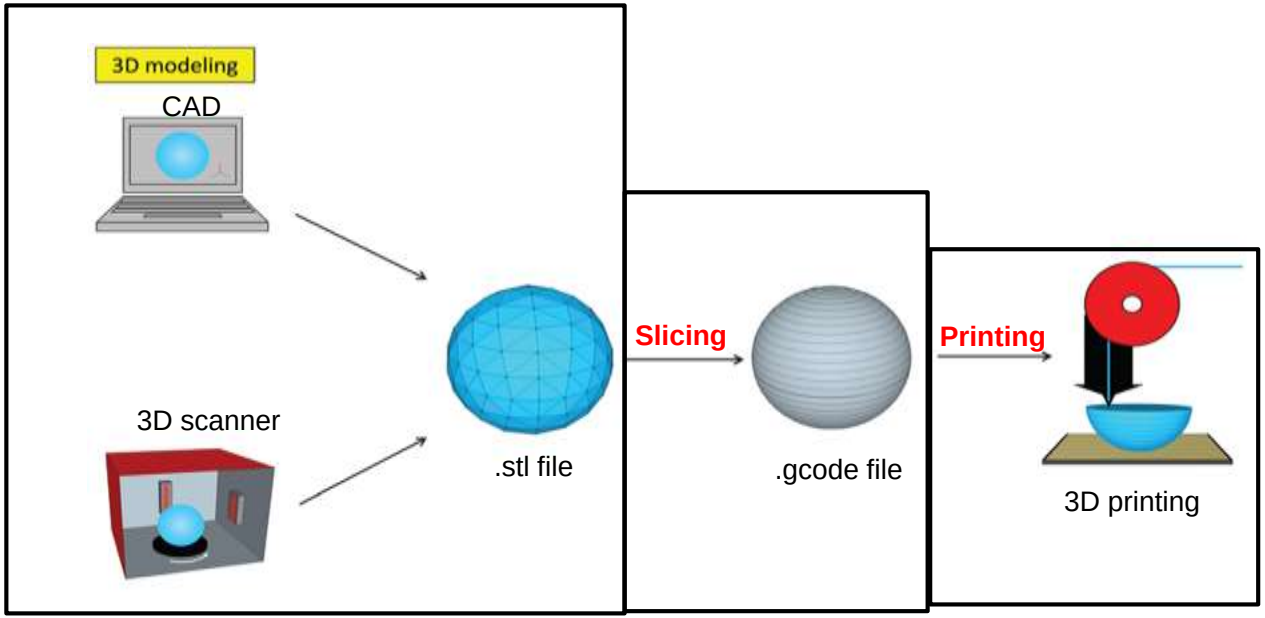
Other applications

Play with color and materials what you need

Demonstration: Step-by-step 3D process



Step 1: 3D designing (AutoCAD, SolidWork etc)
"**Save as**" file must in **.stl** file format

Step 2: Slicing (Machine compatible software e.g. Simplify3D, Ultimaker Cura (Ultimaker), Z-Suit (Zortax))

Step 3: Upload file and print model on 3D printer

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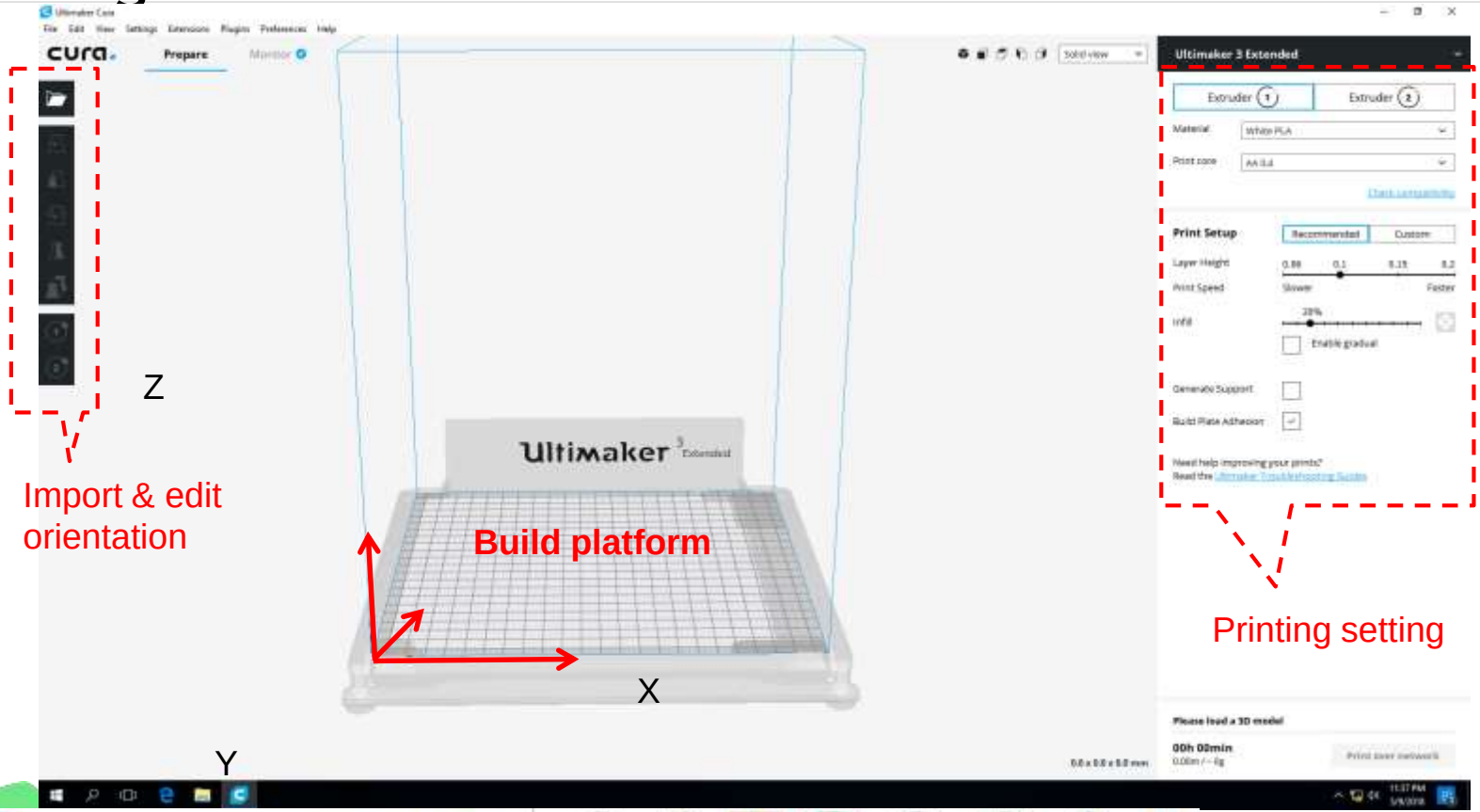
Slicing software: Ultimaker Cura



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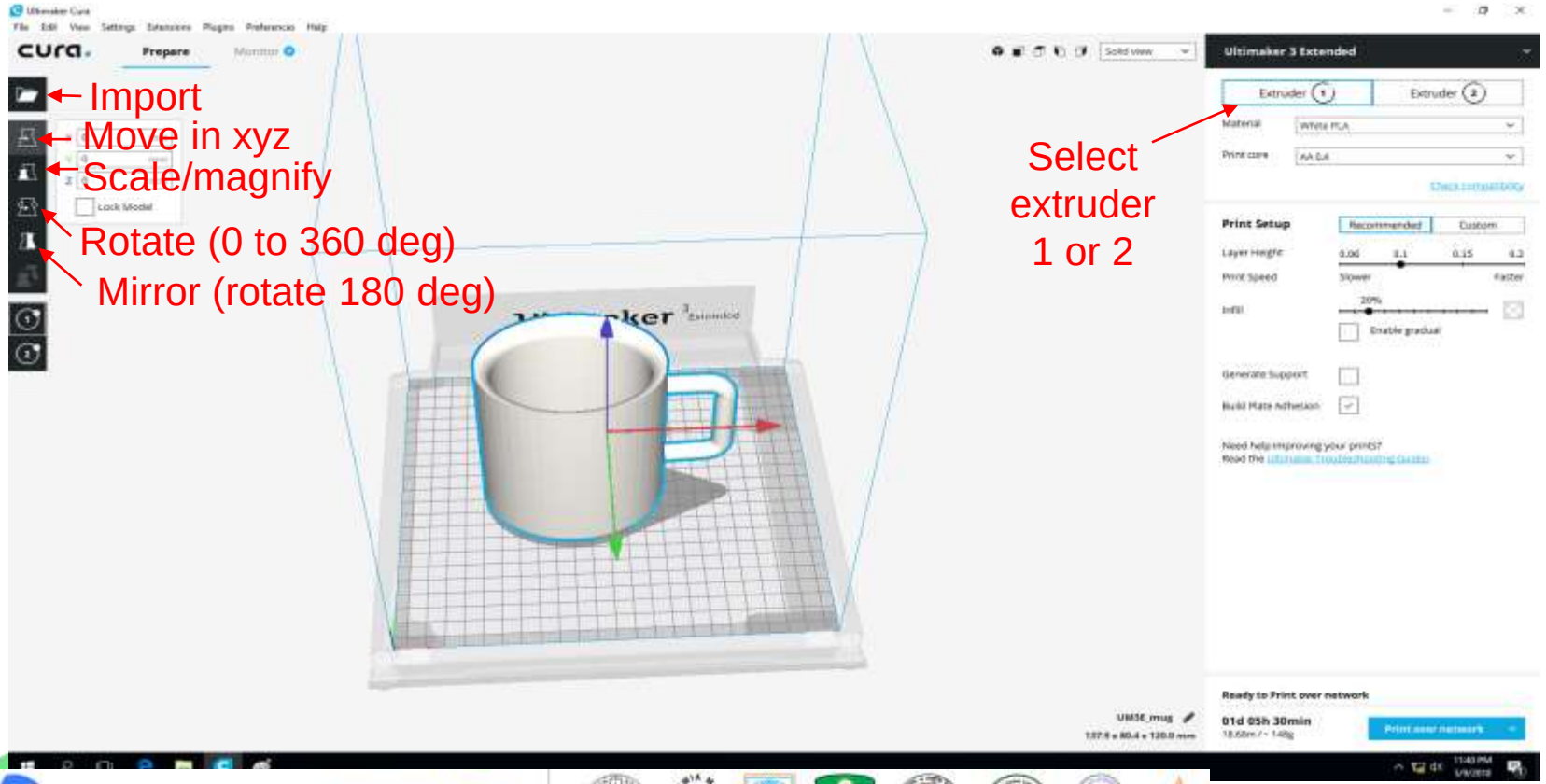
Ultimaker Cura: Custom setting



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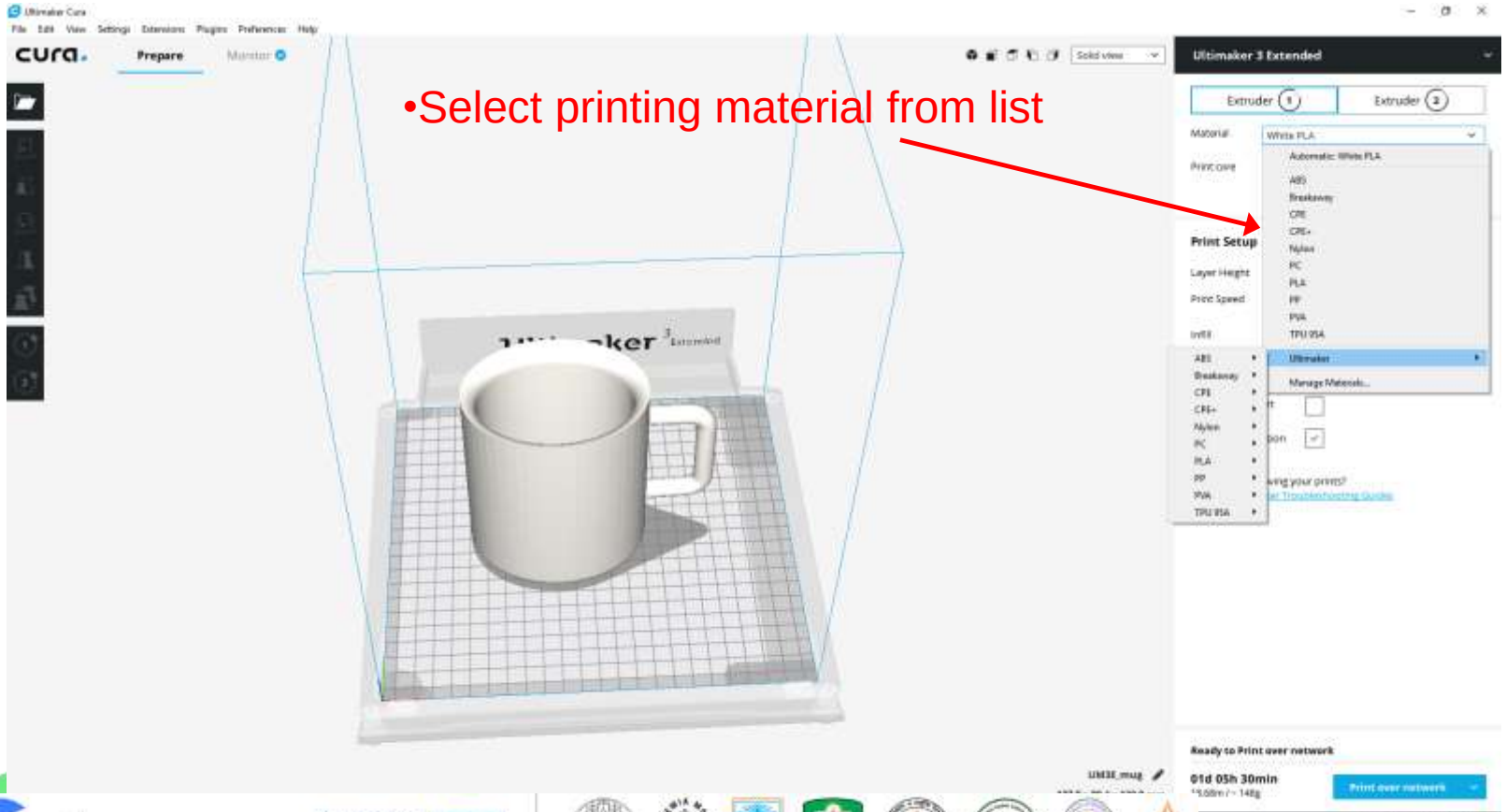
Material selection



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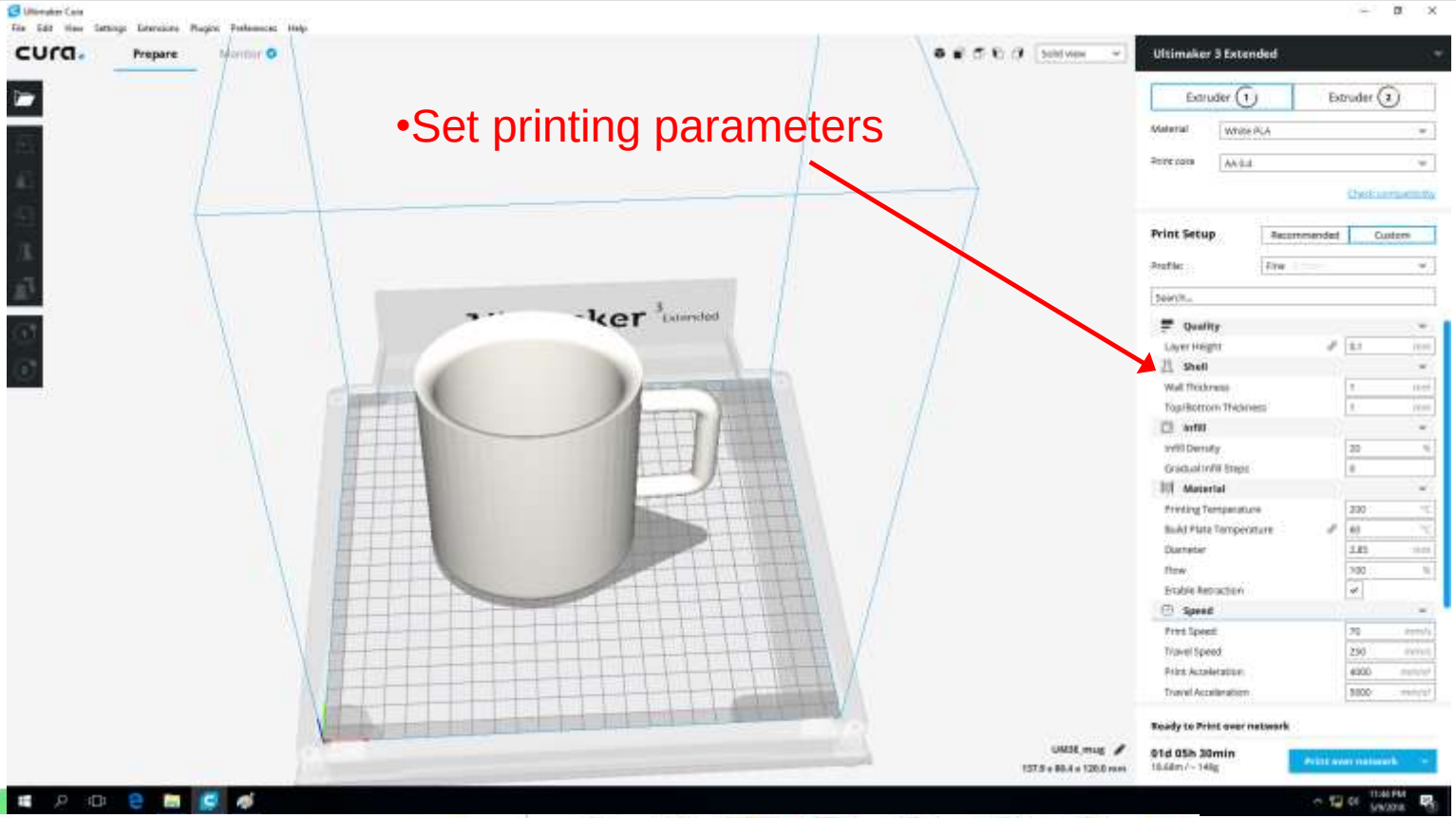
Custom setting



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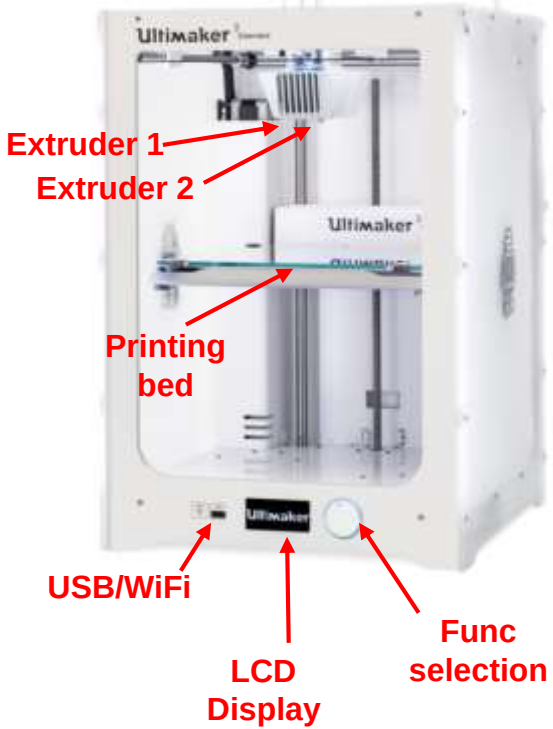
Ultimaker 3 Extended (Netherlands based)



Technical Specs:

- Build volume: 215 x 215 x 200 mm
- Resolution: 0.02 to 0.3 mm (z-axis) and 0.4 mm (xy-plane)
- Print Temp: up to 280 ºC
  Bed Temp: up to 100 ºC
- Dual extrusion

- **Filament diameter: 2.85 mm**

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Best quality printing: tips and tricks?

- **Good printer**: should be chosen based on the job propose
- **Printer's age**: quality degrades over time for all printers
- **Filament quality**: should be less dia variation, dry
- **Printing resolution**: optimise with time and purpose
- **Printing conditions**: temperature (follow manufacturer guide), speed (use 100% > 60mm/sec), flow rate (use 100%), infill (depend on model), support (depends on model) etc.
- **Post treatment:** Acetone vapour bath

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Prototyping Hacks

Do it yourself

Let others do it for you

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Prototyping Hacks

Do it yourself

CAD Software

Let others do it for you

3D Printing

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Prototyping Hacks

Do it yourself

CAD Software

3D Printing

Let others do it for you

Technology Partners
(Components / Full Solution)

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Prototyping Hacks

Do it yourself

CAD Software

3D Printing

Let others do it for you

Technology Partners
(Components / Full Solution)

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Example (Do It Yourself With 3d Printing)

Source: 3dprint.com/wp-

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Example (Do It Yourself With 3d Printing)

fiverr. prototype bike Search Fiverr Pro Fiverr Business Explore Messages Lists Orders

Graphics & Design | Digital Marketing | Writing & Translation | Video & Animation | Music & Audio | Programming & Tech | Business | Lifestyle | Trending

Results for "prototype bike"

Category | Seller Details | Budget | Delivery Time | Pro services | Online sellers

10 services available | Sort by Relevance

nicolsfigueroa

I will design and create 3d models for 3d printing or cnc

pathuthilina97

I will design mechanical 3d models for manufacturing

ubaid_271

I will develop creative designs for patents and reverse engineering

sahiru_dilan
Level 1 Seller

I will do arduino programming and other electronic projects

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