FAB STORMING

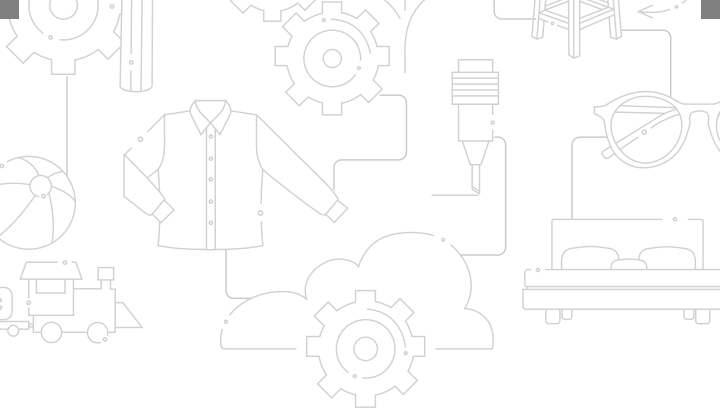
Fab Storming is a gamified ideation tool developed from the seven opportunities of digital fabrication presented.

With it, we can exercise creativity to solve business challenges, using Digital Fabrication opportunities as our source of inspiration. It is available for testing in its online version.

Learn more about this project on the website:
https://fablab.casafirjan.com.br/#!/projects/fab-storming

CASA FIRJAN'S FAB LAB

Learn more about Casa Firjan's Fab Lab, its schedule and projects on the website **fablab.casafirjan.com.br** or contact us by e-mail: **casafirjan.fablab@firjan.com.br**.



BUSINESS CASE STUDIES

Digital Fabrication

Firjan SENAI SESI IEL CIRJ

INTRODUCTION

This is an **educational material** developed with the aim of helping companies and entrepreneurs to **visualize the opportunities** generated by **digital manufacturing** technologies for their businesses.

We will be presenting seven opportunities fostered by these **technologies** to inspire you. Each of the opportunities is illustrated with **business case studies**, containing links to the corresponding sites.

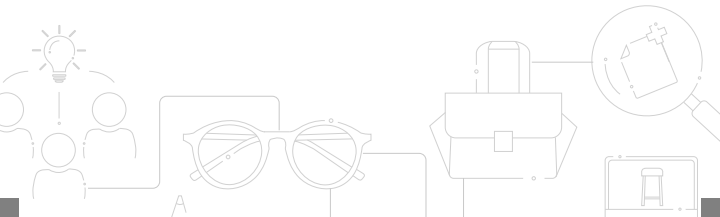
This tool was created to be used within **Casa Firjan courses**, and it can also be applied in other contexts such as **case study dynamics**, workshops or **ideation sessions** on the subject.

Have a good reading!

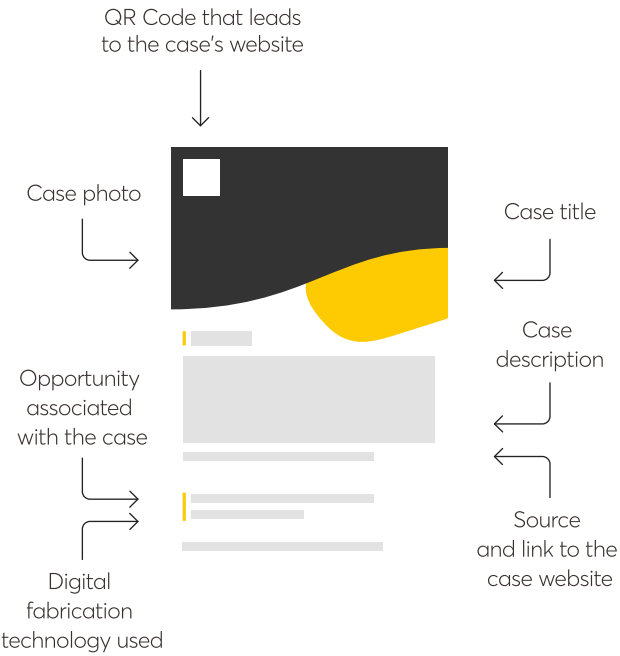
Firjan SENAI SESI IEL CIRJ

DIGITAL FABRICATION OPPORTUNITIES

1. Co-production with the user
2. Fabrication on demand
3. Customization
4. Decentralized production
5. New processes, shapes, and materials
6. Open innovation
7. Production optimization



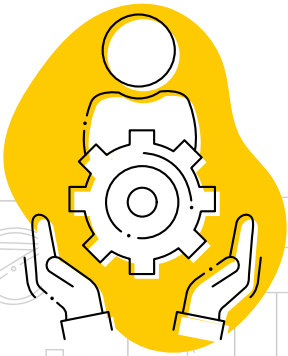
CARD STRUCTURE



Firjan SENAI SESI İEL CİRJ

OPPORTUNITY 1

CO-PRODUCTION WITH THE USER

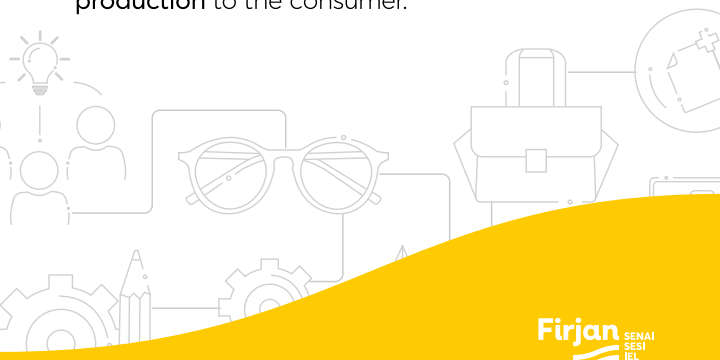


Firjan SENAI SESI IEL CIRJ

CO-PRODUCTION WITH THE USER

Access to digital fabrication tools allows **customers** to take part in the making of their own product.

This is an opportunity to **market the project files** and their inputs, leaving the final stage of **production** to the consumer.



Firjan SENAI SESI IEL CIRJ

KINEMATICS APP

Description

The Nervous System company allows its customers to fabricate demonstration versions of its product at home, bringing people closer to its innovative process that employs computer simulations to generate unique and accessible art, jewelry, and household items projects.

Source: Nervous System, 2013. Available at: n-e-r-v-o-u-s.com/kinematics

Opportunity: Co-production with the user
Technologies: 3D Printing

LOPER SHOES

Description

Make your shoe yourself, your way. Proef sells a basic kit containing the soles and manual sewing materials and makes the upper (upper part of the shoe) file available for the user to laser cut wherever they are, in the material and color of their choice.

Source: Proef, 2016. Available at: loper.store

Opportunity: Co-production with the user
Technologies: Laser cutting

FACILIT HOMES

Description

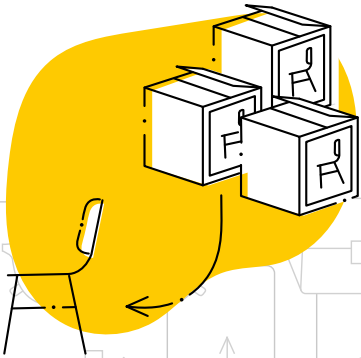
Facit Homes pioneers digital housebuilding by merging precision engineering with sustainable design. By replacing traditional construction methods with a patented "kit of parts" system, they deliver high-performance homes with unmatched efficiency.

Source: Facilit Homes, 2025. Available at: facit-homes.com

Opportunity: Co-production with the user
Technologies: 3D Printing

OPPORTUNITY 2

FABRICATION ON DEMAND



Firjan SENAI SESI IEL CIRJ

FABRICATION ON DEMAND

With digital fabrication it is possible to enable production on demand, **changing** the logic of stock and mass production.

This is an opportunity to fabricate products on a small scale for a **niche market**, or even to fabricate unique pieces that will provide **exclusivity** to the customer.

Firjan SENAI SESI IEL CIRJ

ART4LEG COVER

Description

The Art4Leg company developed a cover for lower limb prosthesis, ensuring a natural anatomical volume. Through 3D printing and body scanning, it allows customization according to the user's tastes and needs.

Source: Art4Leg, 2017. Available at: bit.ly/art4leg

Opportunity: Fabrication on demand
Technologies: 3D Printing, 3D Scanning

3D PRINTED JACKET

Description

3D Printed Jacket, created by designer Danit Peleg, is the first ready-to-wear 3D printed jacket available for purchase online. Each piece is unique, made with customizations of size and fabric, in a limited edition of 100 jackets.

Source: Danit Peleg, 2025. Available at: danitpeleg.com

Opportunity: Fabrication on demand
Technologies: 3D Printing

NAGAMI CHAIRS

Description

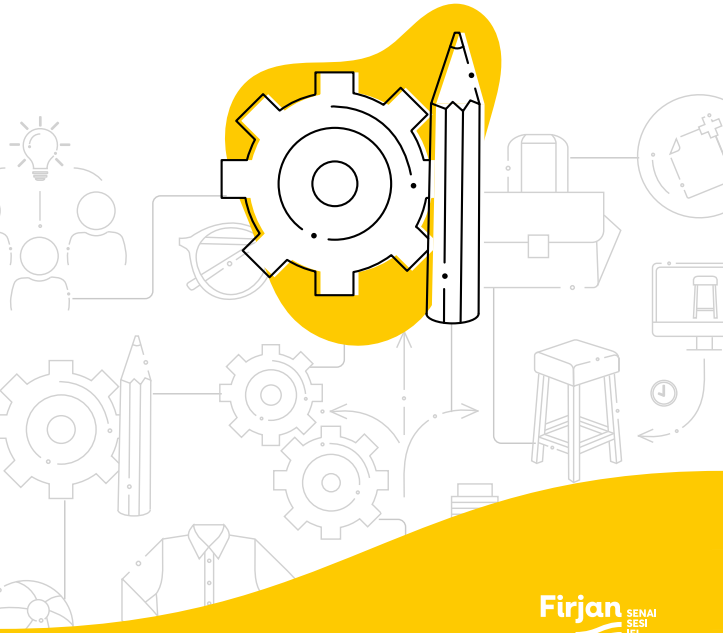
The Nagami company invests in overcoming the limitations of conventional design. To achieve greater efficiency, the company developed its own extrusion method for additive manufacturing, making its line of chairs rich in details and sinuous lines that bring exclusivity to its customers.

Source: Nagami, 2016. Available at: nagami.design/en

Opportunity: Fabrication on demand
Technologies: 3D Printing

OPPORTUNITY 3

CUSTOMIZATION



Firjan SENAI SESI IEL CIRJ

CUSTOMIZATION

Digital fabrication enables the **customization** of your products according to your customer's **wishes and needs**.

This is an opportunity to **create projects** that are tailored to the users' measurements, with their preferred materials and shapes, totally in accordance with their **needs**.

Firjan SENAI SESI IEL CIRJ

HEXR HELMET

Description

Hexr Helmet is a 3D-printed personalized protective helmet for cyclists. From the 3D scanning of the user's head, Hexr is able to perfectly adapt to the skull, increasing its performance and safety against impact.

Source: Hexr, 2018. Available at: bit.ly/hexrhelmet

Opportunity: Customization
Technologies: 3D Scanning, 3D Printing

HERO FORGE

Description

Hero Forge is a groundbreaking, free-to-use in-browser character & custom miniature creator that empowers creators to design and order their own custom miniatures and personalized characters.

Source: Hero Forge, 2025. Available at: heroforge.com

Opportunity: Customization
Technologies: 3D Printing

ZELLERFELD

Description

Zellerfeld revolutionizes footwear with fully 3D-printed, customizable shoes. Their on-demand manufacturing eliminates inventory waste while offering perfect-fit designs tailored to individual scans. Featured by pioneers like Heron Preston, they merge cutting-edge tech with sustainable production.

Source: Zellerfeld, 2025. Available at: zellerfeld.com

Opportunity: Customization
Technologies: 3D Scanning, 3D Printing

OPPORTUNITY 4

DECENTRALIZED PRODUCTION

Firjan SENAI SESI IEL CIRJ

DECENTRALIZED PRODUCTION

The **global connection** of digital fabrication environments allows the creation of a decentralized **production network.**

This is an opportunity for the project to be made **close to the consumer**, optimizing logistics processes, and facilitating the adaptation of designs to **local characteristics and materials**.

Firjan SENAI SESI IEL CIRJ

OTTO DIY

Description

The Otto DIY company sells educational robotics kits. As it is an open-source project, it allows people all over the world to create new versions of it. The licensed vendor strategy enables the global production and commercialization of their models.

Source: Otto DIY, 2014. Available at: bit.ly/ottodiy

Opportunity: Decentralized production
Technologies: 3D Printing, Robotics

MONO DESIGN

Description

Mono Design designs furniture tailored to users, which is always produced through digital fabrication. Using CNC Router technology, digital files can be shared with its producers around the world, so that the pieces are manufactured as close to the user as possible.

Source: Mono Design, 2025. Available at: monodesign.com.br

Opportunity: Decentralized production
Technologies: CNC Milling

OPEN DESK

Description

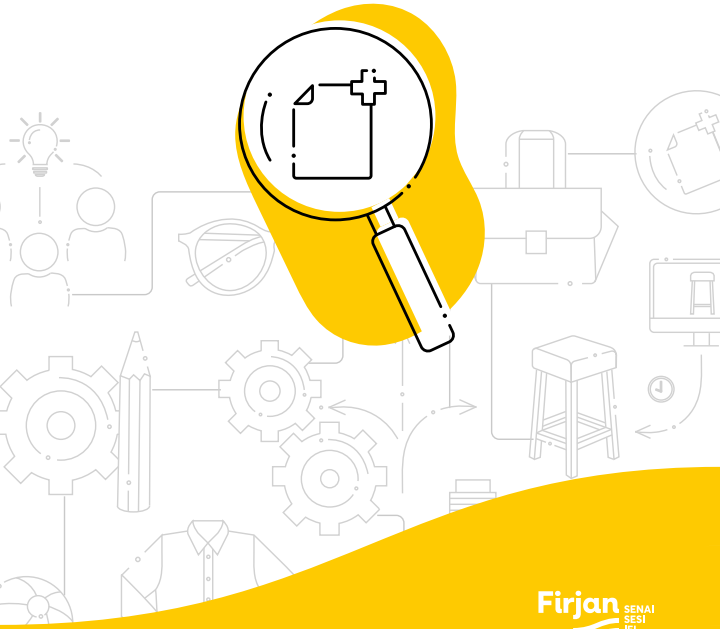
Open Desk is an online marketplace that hosts independent furniture designs and connects its customers to local manufacturers. That is, instead of mass manufacturing and shipping around the world, they build a distributed supply chain through a global network of manufacturers.

Source: Open Desk, 2020. Available at: bit.ly/opendeskcc

Opportunity: Decentralized production
Technologies: CNC Milling

OPPORTUNITY 5

NEW PROCESSES, SHAPES AND MATERIALS

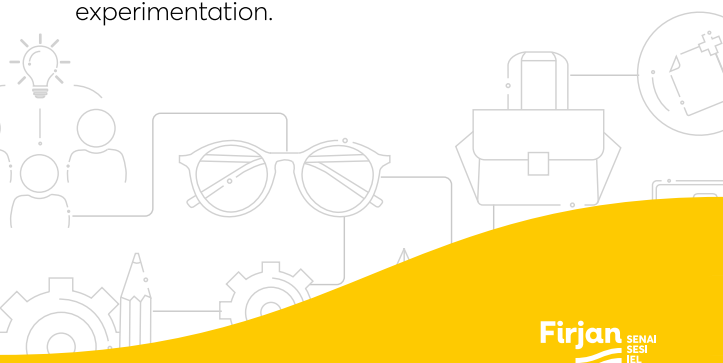


Firjan SENAI SESI IEL CIRJ

NEW PROCESSES, SHAPES AND MATERIALS

With the use of digital fabrication, it is possible to **experiment** with new creative processes, to dare in the shape of products and to innovate in the choice of materials.

This is an opportunity to **develop processes** or products within a culture of constant experimentation.



Firjan SENAI SESI IEL CIRJ

MX3D BRIDGE

Description

The MX3D bridge is a functional construction that will be used for crossing a canal, made of stainless steel from robots and 3D printing.

Source: MX3D, 2018. Available at: mx3d.com

Opportunity: New processes, shapes, and materials
Technologies: 3D Printing

INOVA HOUSE 3D

Description

Inova House 3D is a company founded in 2015 that, based on the research to bring 3D printing processes in civil construction to Brazil, today builds houses which, while incorporating the characteristics of this process as architectural elements, do not require basic steps of traditional civil construction.

Source: Inova House 3D, 2021. Available at: bit.ly/inovahouse3d

Opportunity: New processes, shapes, and materials
Technologies: 3D Printing

BIOEDTECH

Description

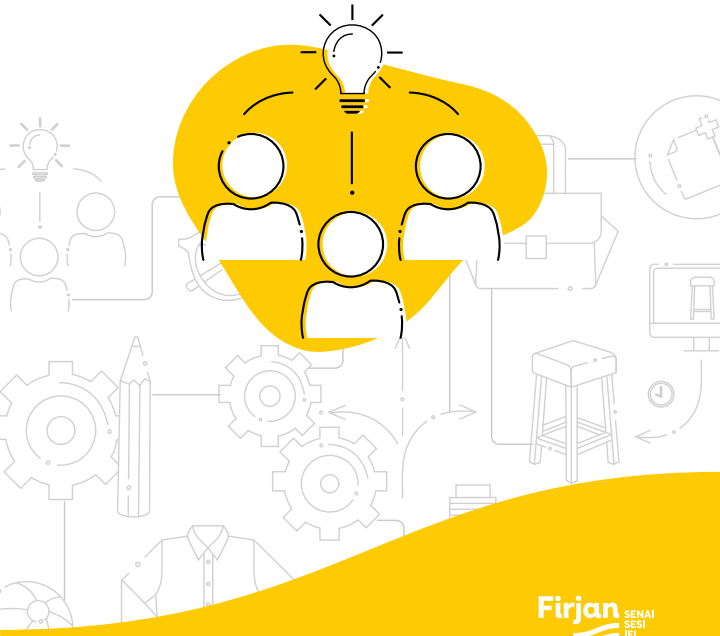
BioEdTech is a Brazilian startup founded in 2018, which uses 3D bioprinting processes for the study, prototyping and fabrication of tissues and organs, from compounds of biofibers, biomolecules and cells.

Source: BioEdTech, 2021. Available at: bit.ly/casebioedtech

Opportunity: New processes, shapes, and materials
Technologies: 3D Printing

OPPORTUNITY 6

OPEN INNOVATION



Firjan SENAI SESI IEL CIRJ

OPEN **INNOVATION**

Open digital fabrication projects allow for **collaborative** development, accelerating the innovation process.

This is an opportunity to connect with **different ideas**, captivate communities of creators and have a **constant improvement** process, through a **distributed and multidisciplinary approach**.

Firjan SENAI SESI IEL CIRJ

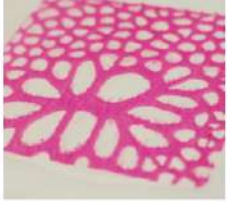
FACE SHIELD COVID-19

Description

Through Prusa Research's Face Shield project sharing initiative, the maker community and several companies around the world have refined and improved the project by locally producing and supplying their hospital communities in combating the Covid-19 pandemic.

Source: Prusa Research, 2020. Available at: bit.ly/prusacovid19

Opportunity: Open innovation
Technologies: 3D Printing, Laser Cutting





OPEN SOURCE CIRCULAR FASHION

Description

The Open Source Circular Fashion platform is the open repository for project sharing of Fabricademy, a transdisciplinary course that focuses on the development of new technologies applied in the textile industry.

Source: Fab Foundation, 2020. Available at: bit.ly/oscircularfashion

Opportunity: Open innovation
Technologies: 3D Printing, Laser Cutting

SMART CITZEN

Description

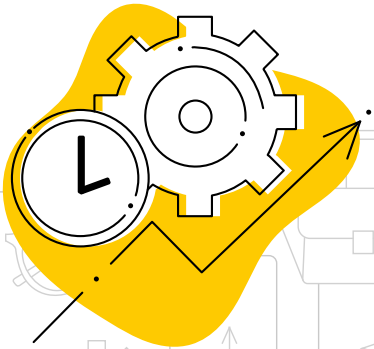
Smart Citzen is a project that unites and encourages a community around the creation and development of monitoring and data collection tools, informing political participation at various levels and enabling the transformation of the city into a Smart City.

Source: Fab Lab Barcelona and IAAC. Available at: smartcitizen.me

Opportunity: Open innovation
Technologies: Arduino

OPPORTUNITY 7

PRODUCTION OPTIMIZATION



Firjan SENAI SESI IEL CIRJ

PRODUCTION OPTIMIZATION

Digital fabrication technologies can be used to **optimize** the company's production processes and reduce its production costs.

This is an opportunity to **change** the way to build and **create tools** that support or reinvent the process.

Firjan SENAI SESI IEL CIRJ

CLOTHING PRODUCTION 4.0

Description

Made by SENAI Cetiqt, it shows the concept of production on demand, in which the user chooses a garment and its print on a virtual mirror, and a robot measures their body. From there, the process is automated for production.

Source: SENAI Cetiqt, 2018. Available at: bit.ly/confeccao40

Opportunity: Production Optimization
Technologies: 3D Scanning

VOLKSWAGEN

Description

Volkswagen Autoeuropa started to fabricate tools and jigs from 3D printing. The company was thus able to reduce the time and cost of obtaining these by 90%, positively impacting its assembly line.

Source: Volkswagen Autoeuropa and Ultimaker, 2017.I
Available at: bit.ly/volks3dtool

Opportunity: Production Optimization
Technologies: 3D Printing

EDG NYC RESTORATION

Description

EDG NYC is an architectural firm that has developed a new digital sculpting method called "Modern Ornamental" to restore a building in New York City. The process uses 3D printing to produce complex molds for molding concrete structures.

Source: EDG NYC. Available at: bit.ly/modernornamental

Opportunity: Production Optimization
Technologies: 3D Printing

Firjan SENAI SESI IEL CIRJ

casafirjan.com.br @casafirjan

Casa Firjan | Rua Guilhermina Guinle, 211
Botafogo, Rio de Janeiro - Brazil

Description

Source: _____ Available at: _____

Opportunity: _____

Technologies: _____