

# Sketch-to-Scale® Experience for RATIO

RATIO begins its day each morning as a coffee shop and converts to a cocktail bar at night.

ROSS DIGITAL reached an important milestone on June 9, 2018 when RATIO, its automated barista project, launched successfully at the K11 Shopping Mall in Shanghai.

## The Product

RATIO is an automated barista that serves a range of beverages throughout the day and night. Customers place beverage orders via an app by scanning a QR code. The app uses a memory function that allows customers to customize personal preferences of their beverage for repeat orders.

Once a customer places an order, a metallic white robotic arm powered by artificial intelligence prepares the beverage. RATIO is a versatile coffee shop in the morning that converts into a cocktail bar at night. In the morning and during the day, RATIO serves various types of coffee, nitro tea, and nitro coffee. At night, it becomes an automated bartender, serving wine, beer and hundreds of cocktail variations.

## Strong Collaboration

We are excited to see the results of our strong partnership with ROSS DIGITAL over the past year. We began working with ROSS DIGITAL when RATIO was just an idea. Now, it is a ready-to-market product.

When we began working with ROSS DIGITAL in June 2017, RATIO was a mere concept supported by a few sketch layouts. We worked closely with the team to develop and formalize bills of materials, specifications, and detailed documentation for the project.

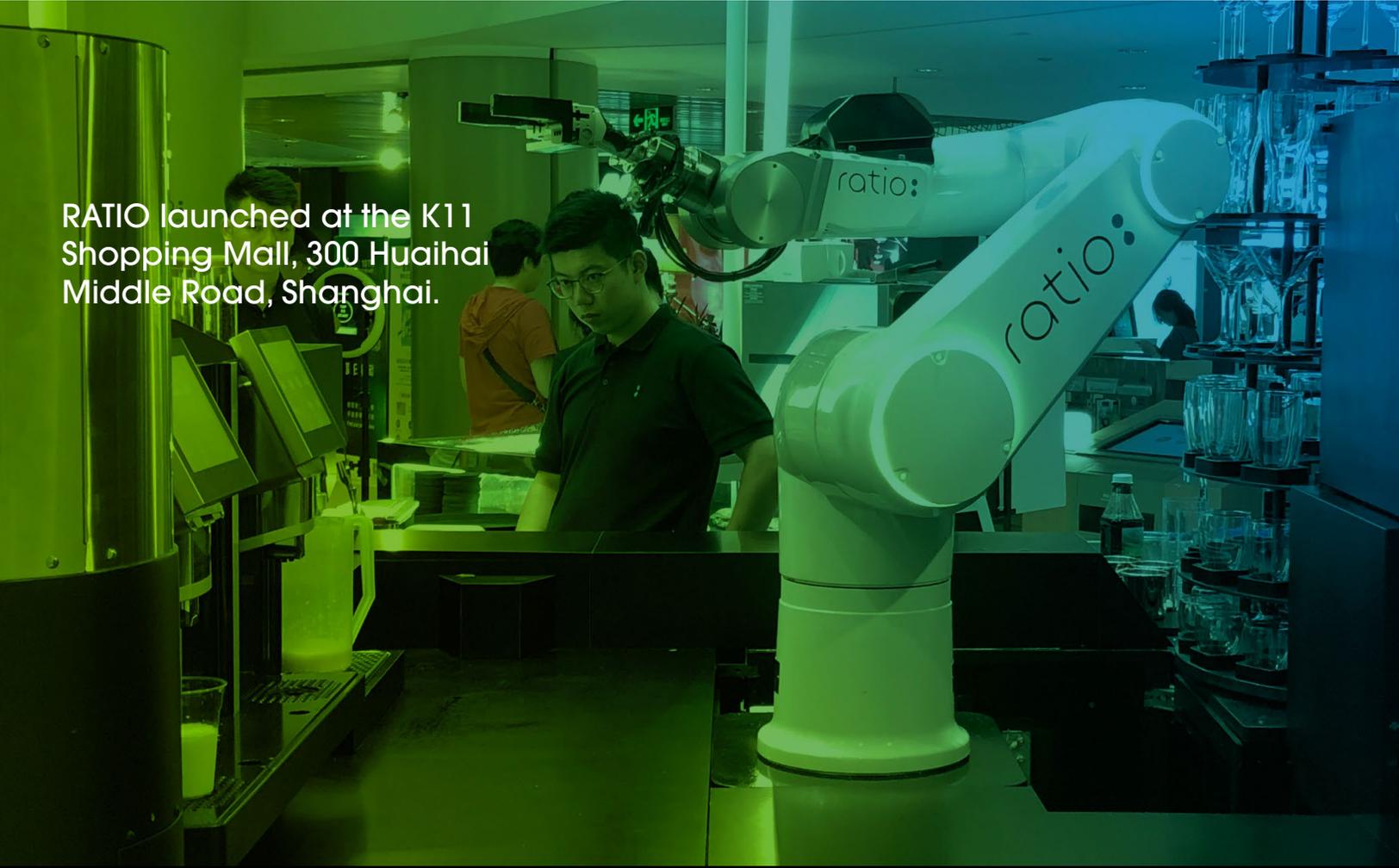
## Sketch-to-Scale®

Our partnership with ROSS DIGITAL exemplifies the power of how a Sketch-to-Scale® solution brings a product from concept to market. We provided mechanical design, software logic and IPC coding, PLC, robotic arm programming, safety features positioning, electric circuitry, water and air management, supply chain setup for parts fabrication, full assembly integration, and stress tests.

In addition, our agile engineering team responded to numerous optimization and design changes that we encountered as part of the design and manufacturing process. Our team experimented with new robotic arm programming logics, including Epson and KUKA. The ultimate logic for the RATIO product became STAUBLI. Our team also needed to work through additional adaptations, including managing multiple versions of chuck designs to accommodate eight different cocktail glass types, interpreting optimization efforts that required redesigns of sub-mechanical elements, and providing on-site final assembly integration support at the end customer site.

## Results

Our collaborative partnership resulted in the first RATIO shop launch on June 9, 2018 in Shanghai. We leveraged our extensive, cross-industry expertise and applied it to a non-traditional electronic customer beyond pure manufacturing to bring value to the project.



RATIO launched at the K11 Shopping Mall, 300 Huaihai Middle Road, Shanghai.

For more information, please visit [www.flex.com](http://www.flex.com) or follow us on Twitter @flexltd

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