



**COMMERCIAL DEVELOPMENT OF AGRI-FOOD TECHNOLOGY  
INCLUDING ROBOTICS AND AI**

**AgriFoRwArdS CDT Conference**

Chris Roberts

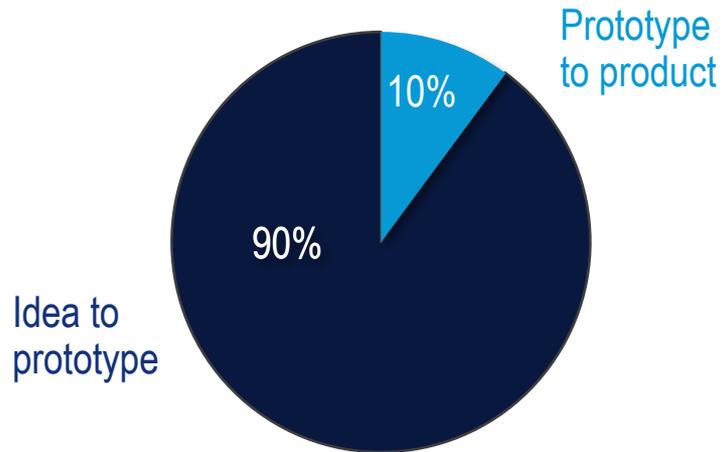
20 March 2020

COMMERCIALLY CONFIDENTIAL

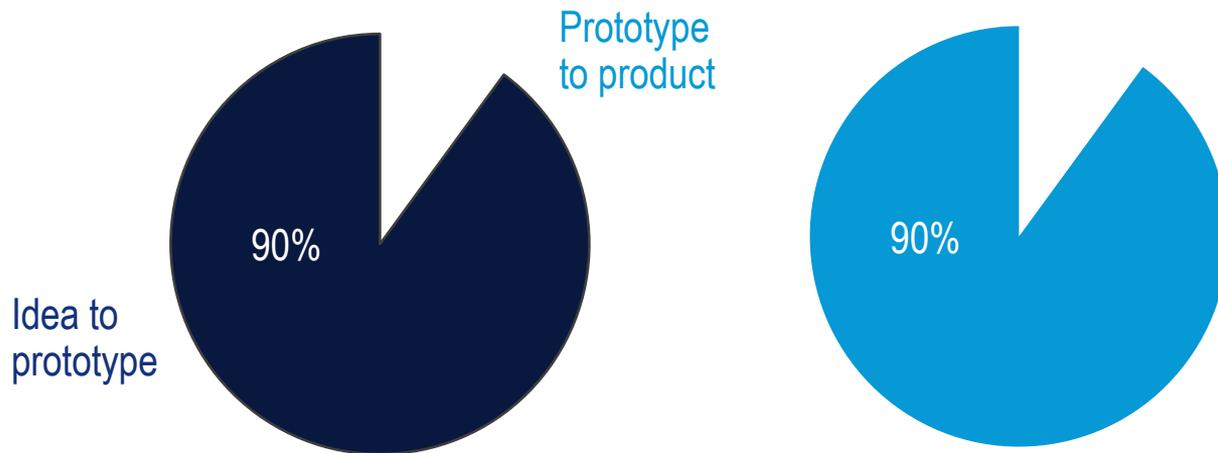
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# Commercial Development of AgriFood technology – Robotics and AI

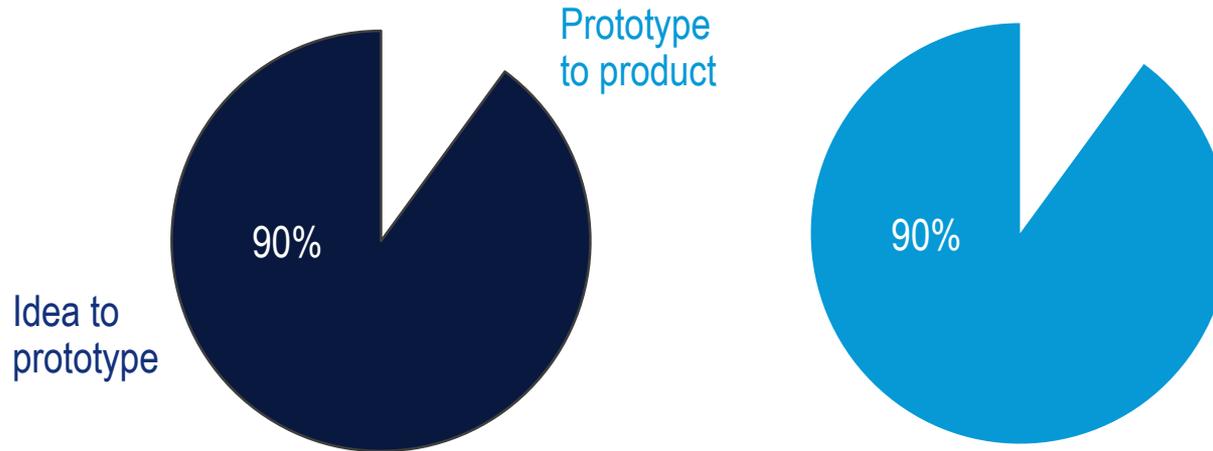
## Commercial Development of AgriFood technology – Robotics and AI



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- Taking an idea to a prototype stage is a huge achievement and is certainly not trivial, but turning that prototype into a commercially successful product is just as hard, and crucially it involves different skills and challenges compared to the prototype stage

## Cambridge Consultants: Key Facts



We are an **engineering design, development**  
and **technology consulting company**



Our **clients own arising IP**,  
with no ongoing encumbrance

## Chris Roberts

*Head of Industrial Robotics*

- Low cost robotics, machine vision and novel automation
- Delivering commercially-ready complex products.

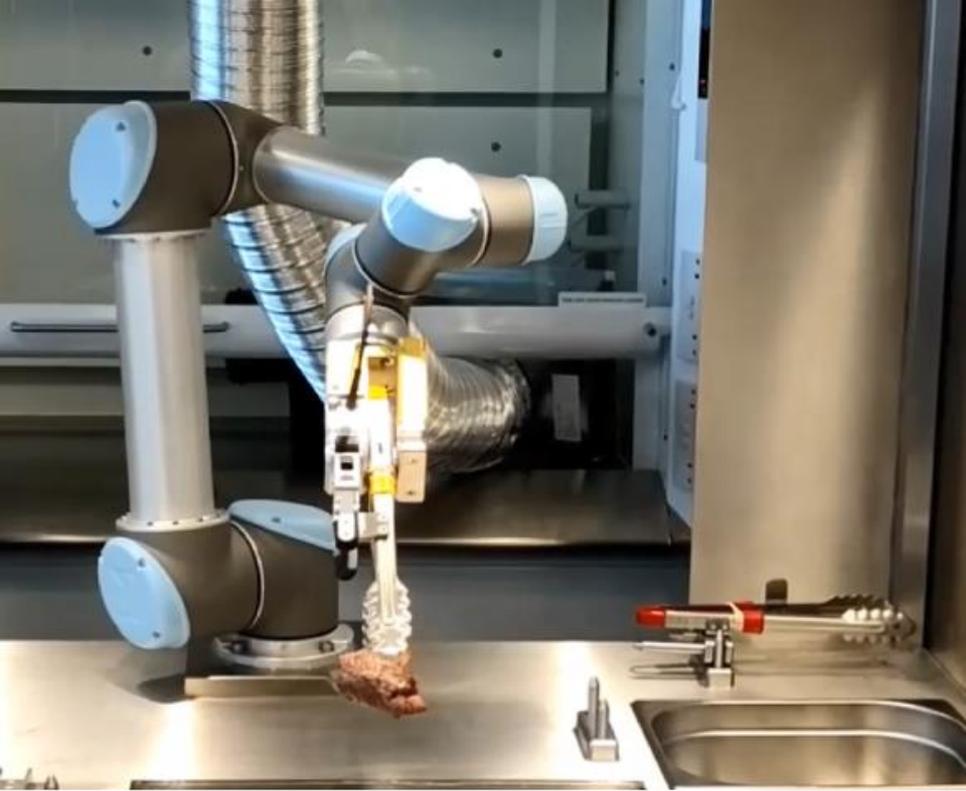


## Commercial Development of Agri-Food technology: Robotics and AI

- Agriculture is facing a variety of challenges that require innovative solutions, including pressures of labour shortages and a desire for increased precision farming
- The market is there for new solution & the technology is ready
- Developing new technology is expensive
- Traditional suppliers are not ready to invest
- How can we address this?
- Be realistic about what it takes to turn an idea into a product



**STRAWBERRY HARVESTING**  
AGRI ROBOTICS

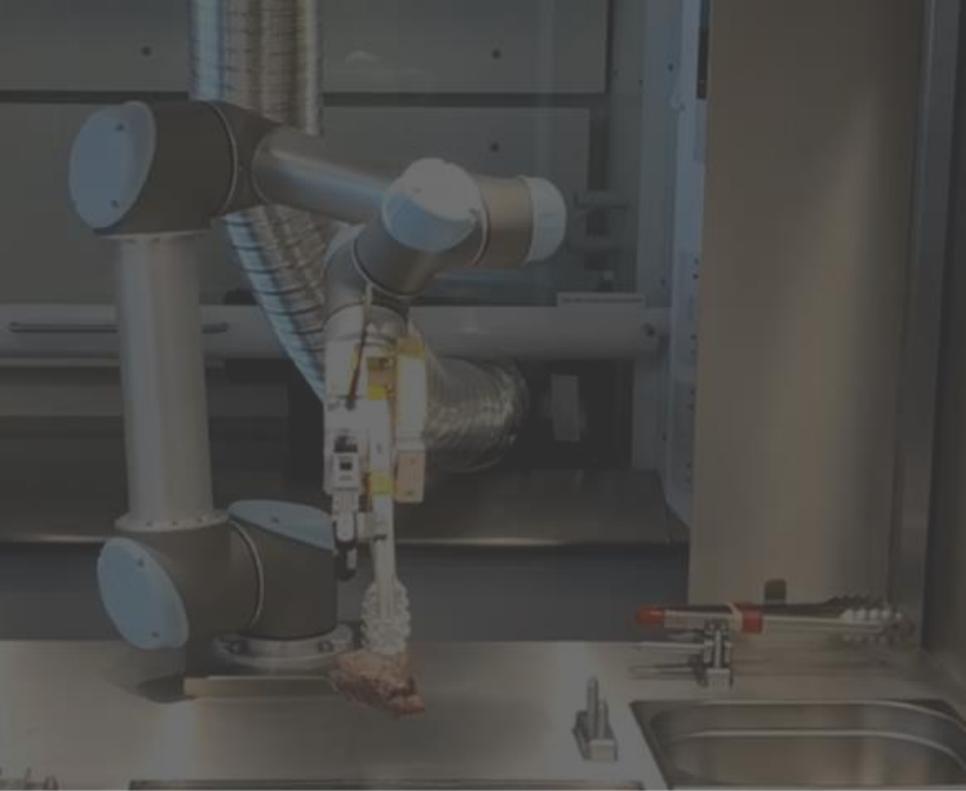


**CATERING**  
RE-THINKING THE INDUSTRIAL KITCHEN



## STRAWBERRY HARVESTING

AGRI ROBOTICS



## CATERING

RE-THINKING THE INDUSTRIAL KITCHEN

## Technical due diligence on an automated strawberry harvesting startup for a large US firm

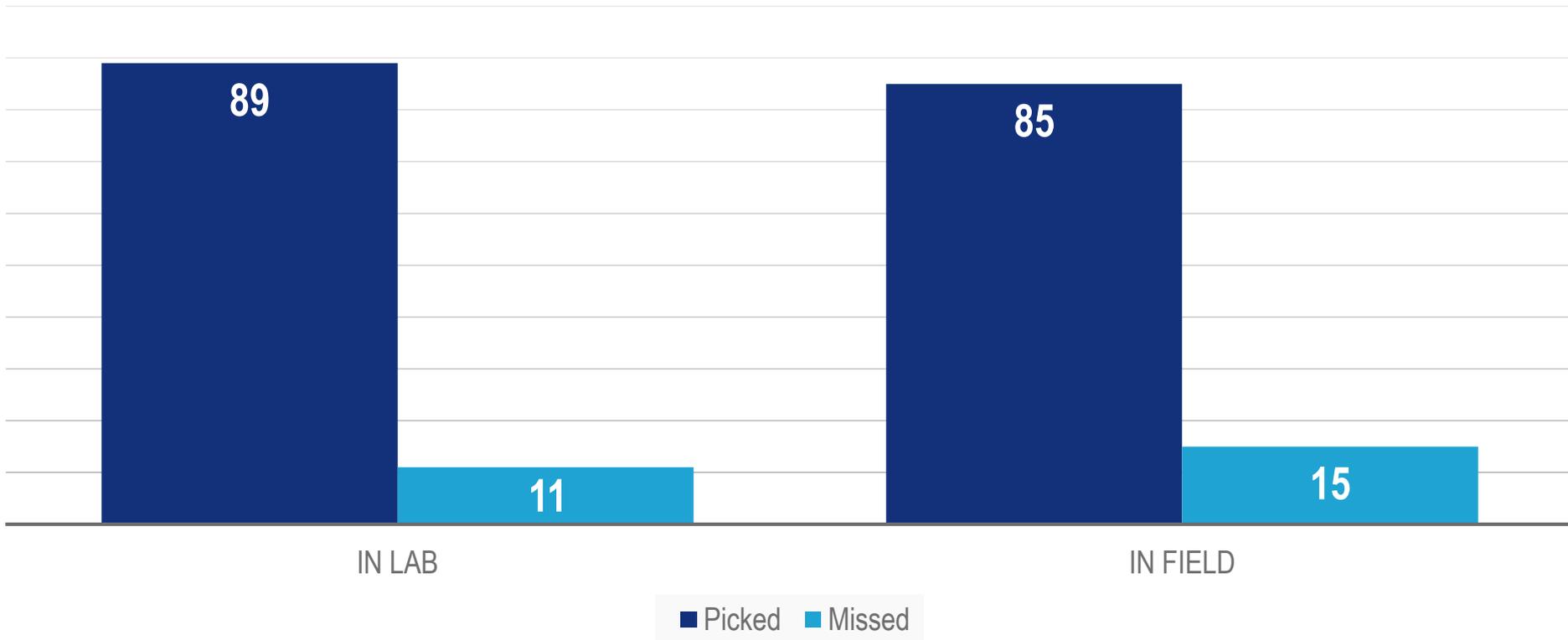
### Does it work?

- How well does it pick strawberries?
- Can we use it in our fields?

### How much more money?

- How much more time to turn it into a product?
- How much more engineering effort?

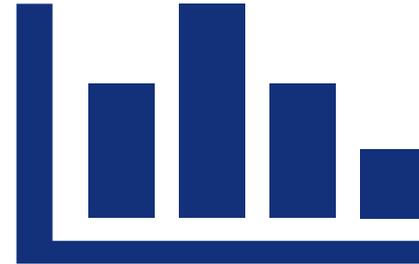
## Success! We can pick 85% of accessible strawberries!



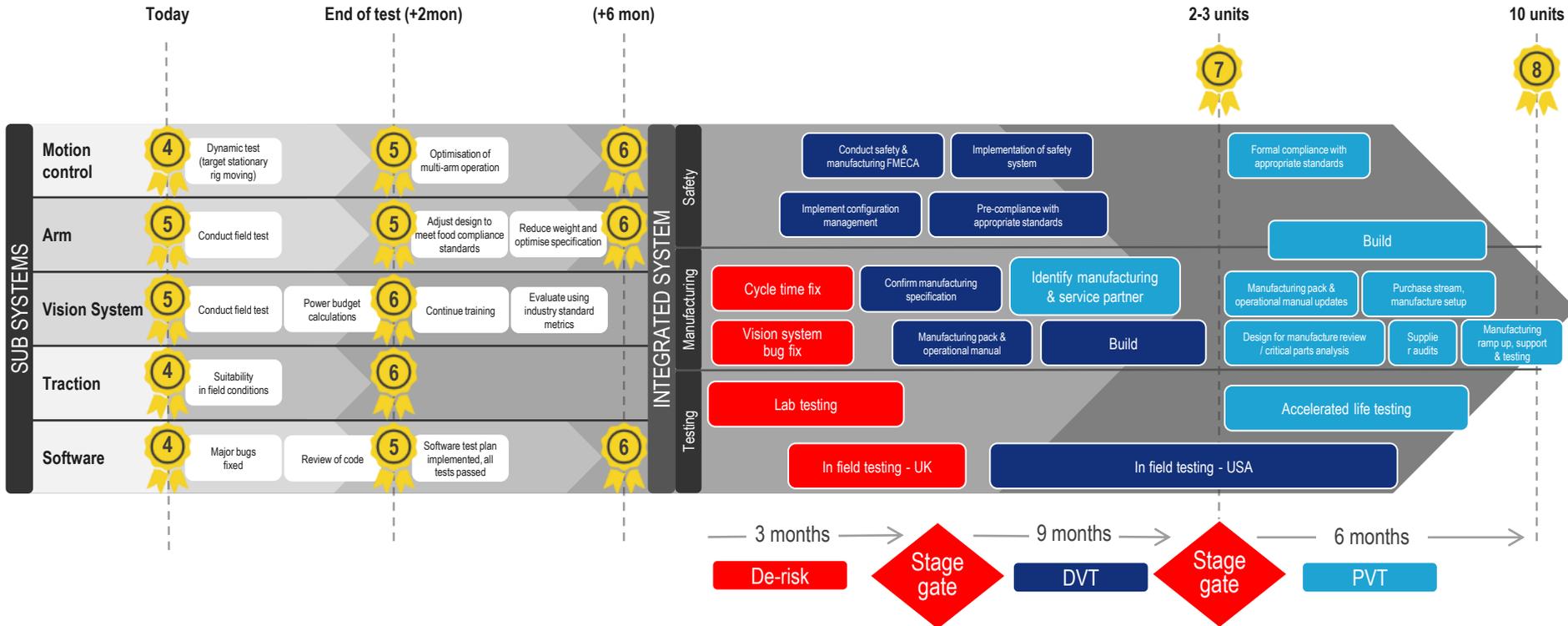
## Success?

Not necessarily...

- Is 85% enough? How well would a human do?
  - How long did it take to pick the 85%? Faster or slower than a human?
  - Did you pick any you shouldn't have?
  - What is "accessible"? Why does that matter?
  - The company is only interested in cost of picking **all** the strawberries
  - What happens after picking – grading, trimming, packing, etc, if the robot doesn't do that, you need more robots
- 
- **Performance metrics must be carefully chosen**



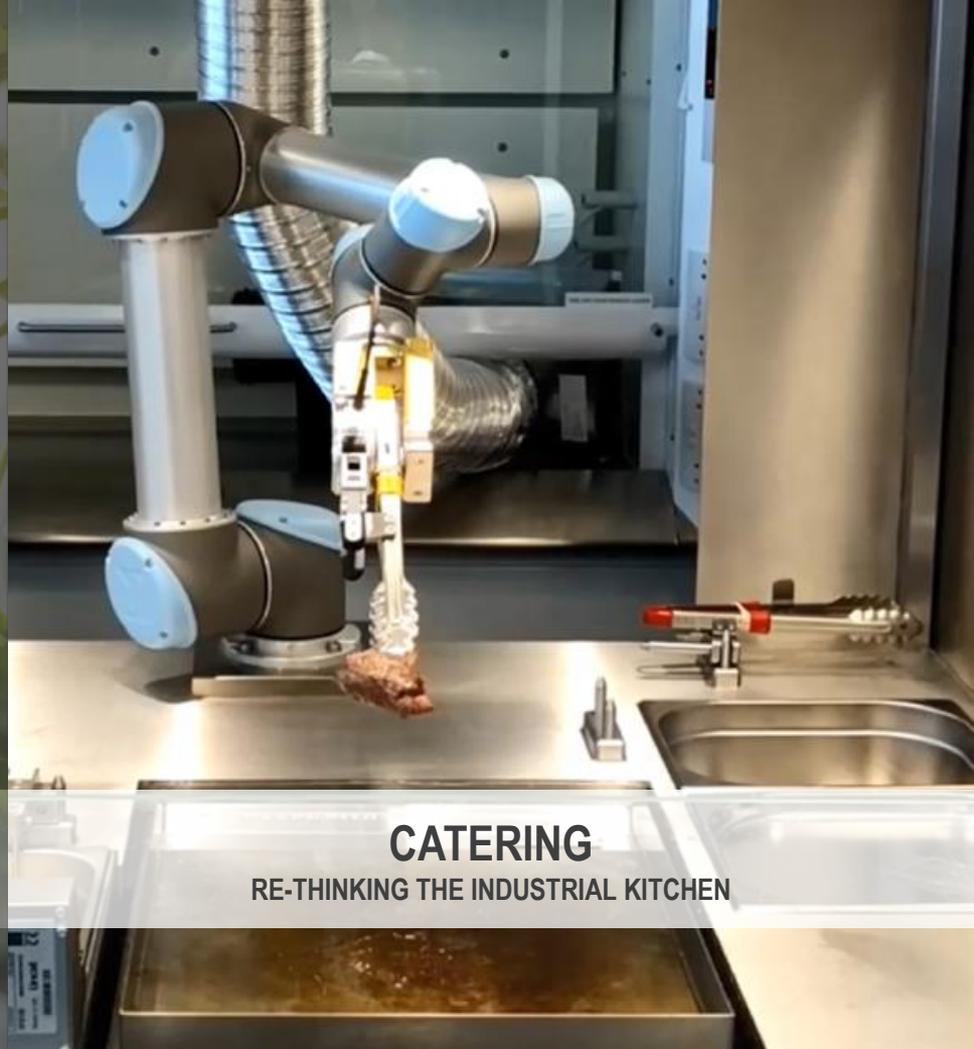
# A significant project remains after prototype





## STRAWBERRY HARVESTING

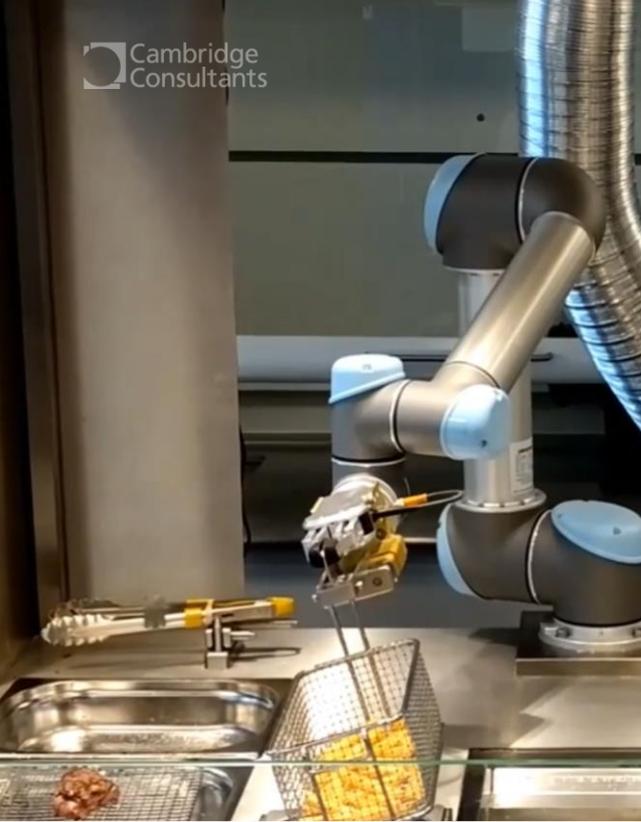
AGRI ROBOTICS



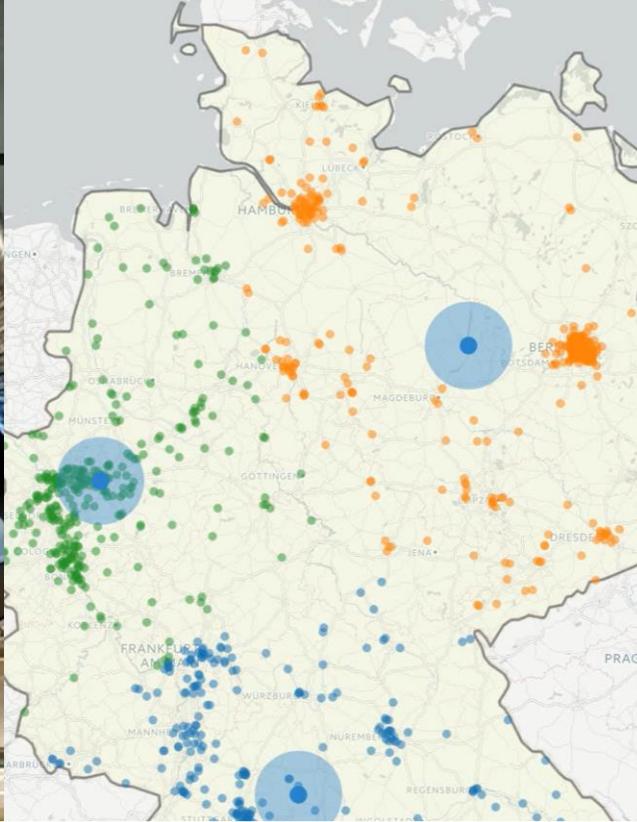
## CATERING

RE-THINKING THE INDUSTRIAL KITCHEN

# HOW CAN WE CREATE TWICE AS MUCH BUSINESS WITH THE SAME NUMBER OF STAFF?



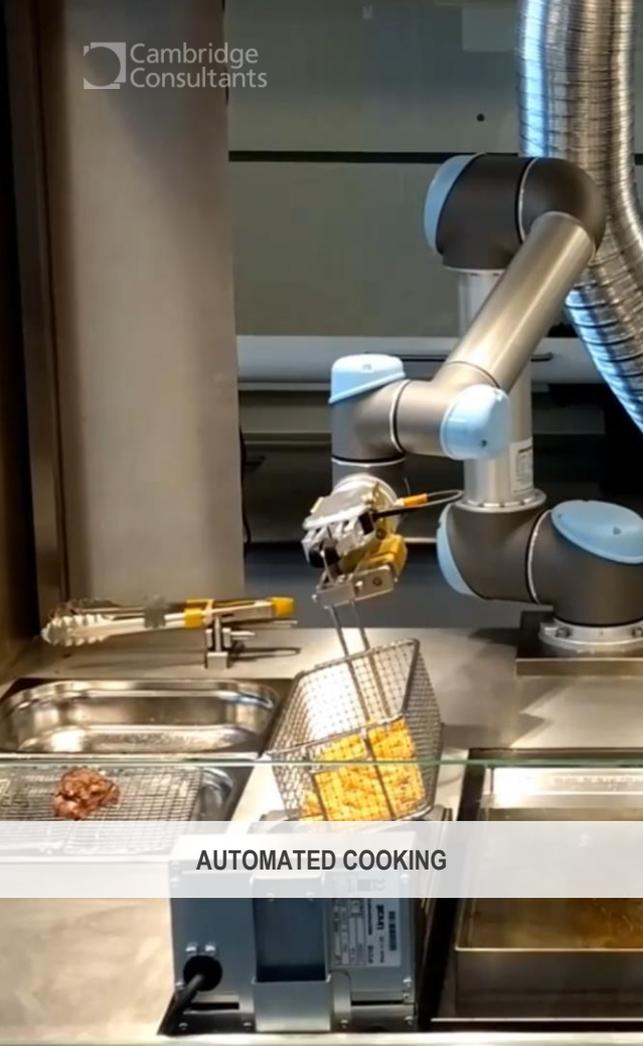
**AUTOMATED COOKING**



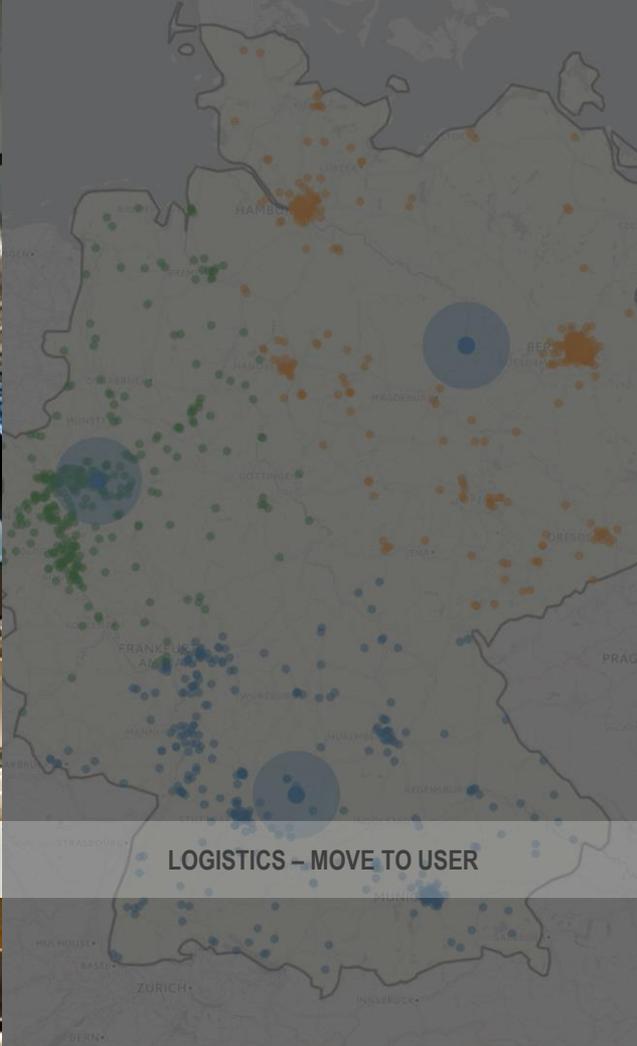
**LOGISTICS – MOVE TO USER**



**DISHWASHER LOADING**



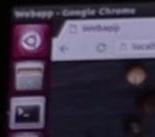
**AUTOMATED COOKING**



**LOGISTICS – MOVE TO USER**

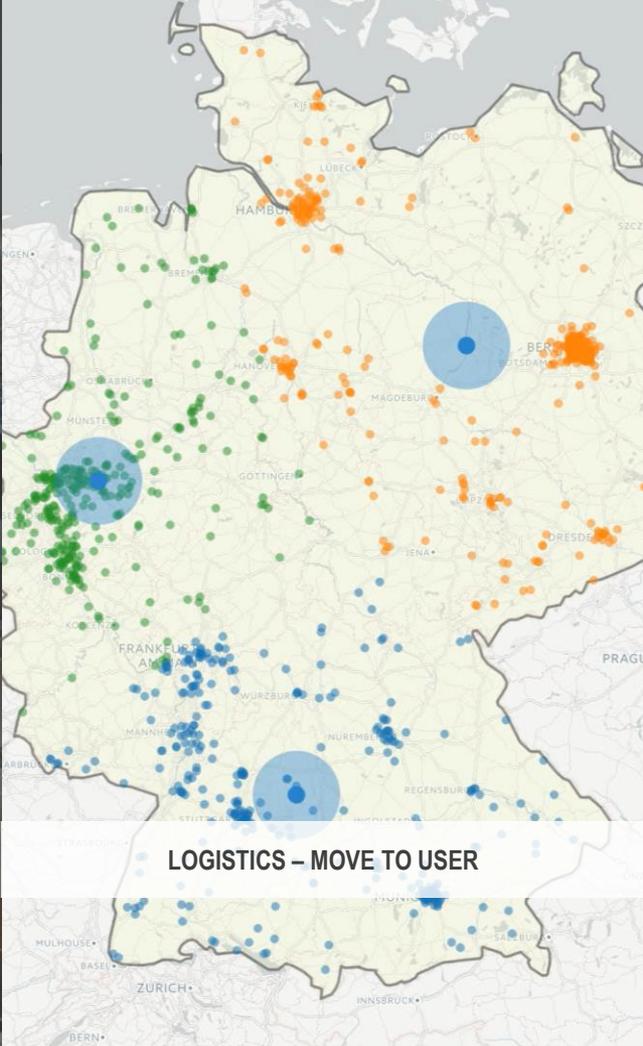


**DISHWASHER LOADING**

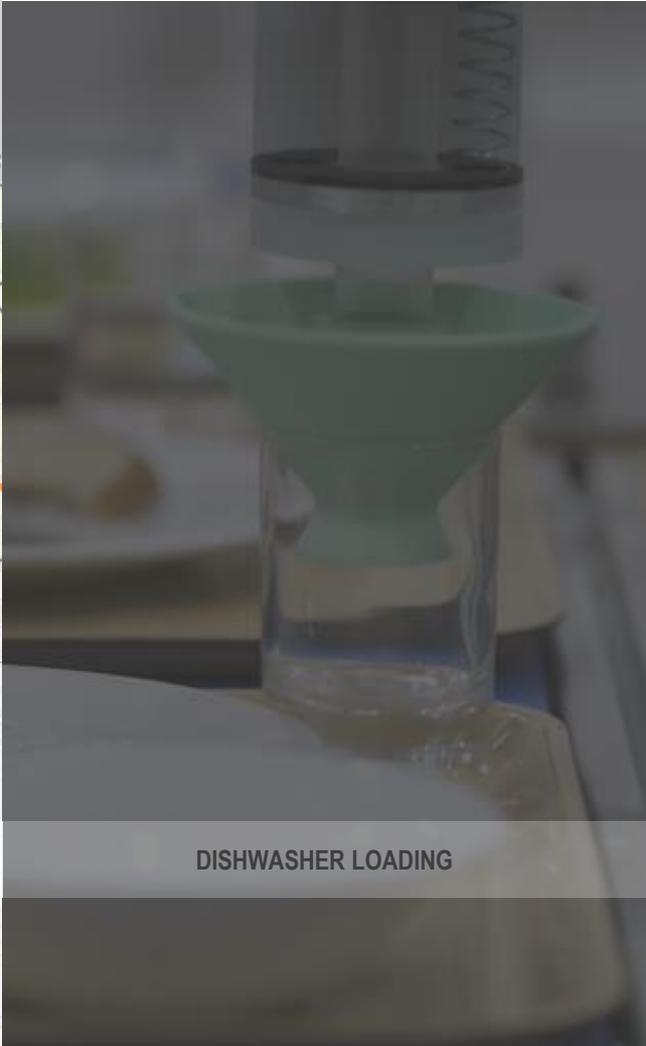




**AUTOMATED COOKING**

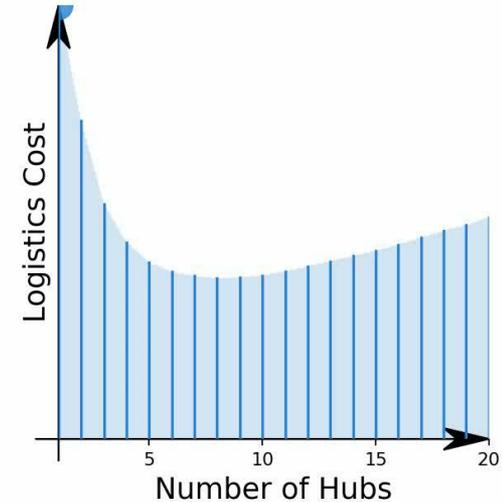
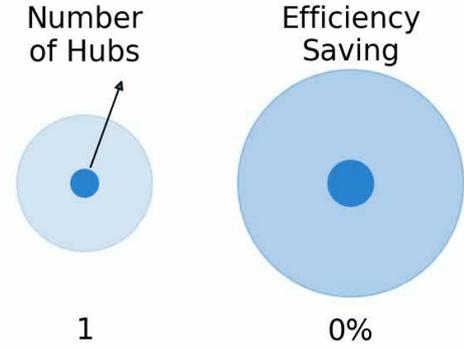
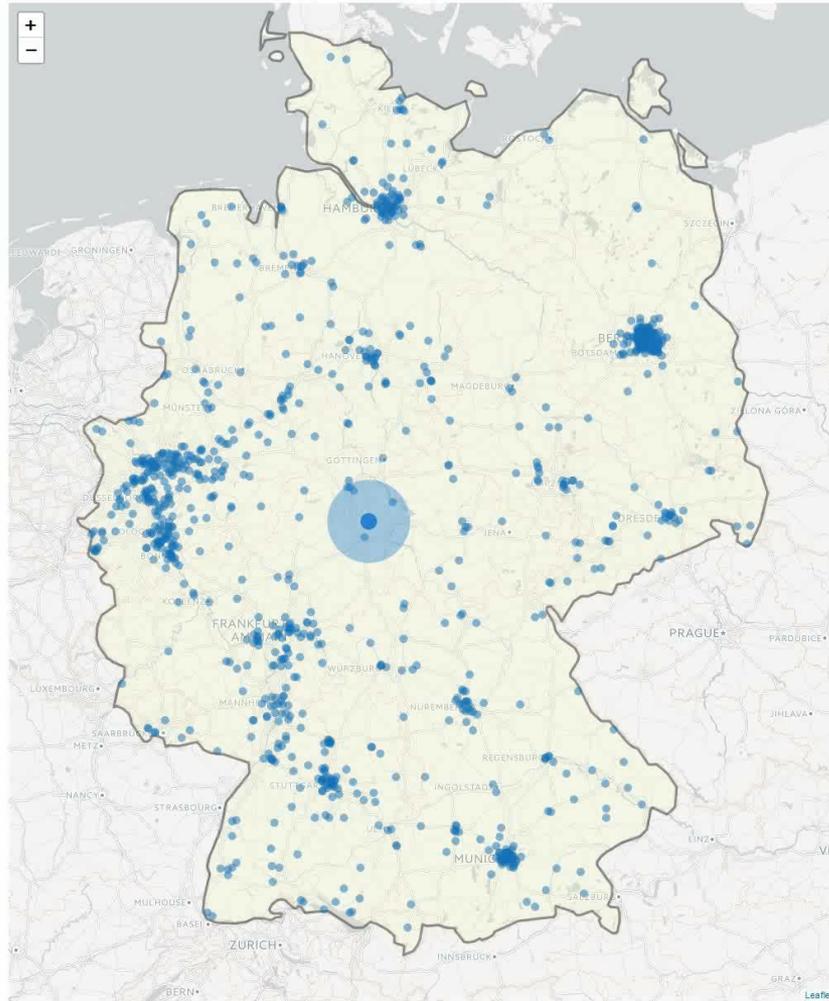


**LOGISTICS – MOVE TO USER**



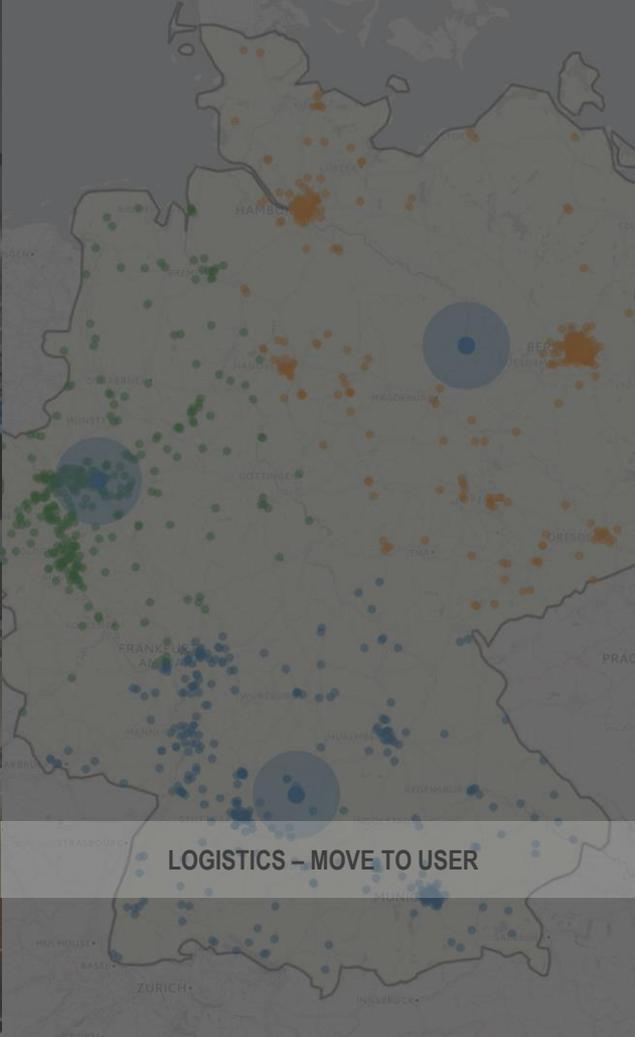
**DISHWASHER LOADING**

# Optimising hub placement to improve cost and efficiency





**AUTOMATED COOKING**



**LOGISTICS – MOVE TO USER**

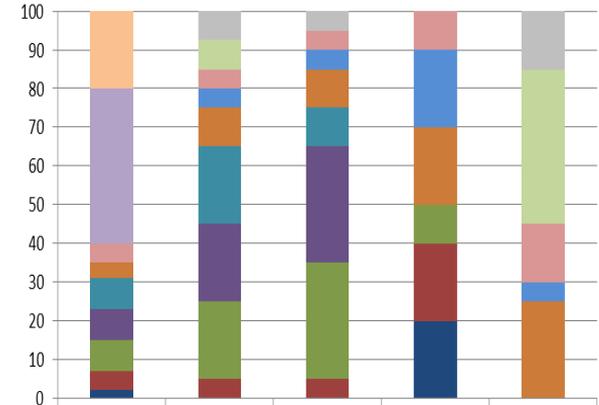


**DISHWASHER LOADING**



## Dishwasher loading

There is not a lot of slack in a day so there is no added efficiencies which can be achieved by a human



Each bar is a type of staff member  
Each colour is a task type



## Commercial Development of AgriFood technology – Robotics and AI

- Be realistic about what it takes to turn a idea into a product
- Understand all the costs involved and who should pay them
- Focus on the metrics that are important to your customer

