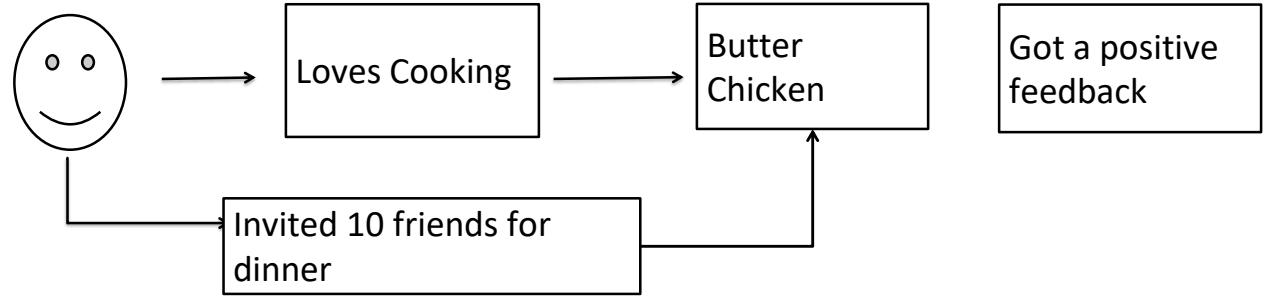


Human Centered Artificial Intelligence Masters BIP Utrecht.

Presented By Nikhil Ranjan Rajhans (University of Naples Federico II)
Supervisor : Mr Tarry Singh (Real AI)

PICO-ML : Intelligent pipeline continuous optimization
MLOps refers to the practice and discipline within machine learning that aims to unify and streamline the machine learning system development (Dev) and machine learning system operations (Ops). It involves collaboration between data scientists, ML engineers, and IT professionals to automate and optimize the end-to-end lifecycle of machine learning applications.

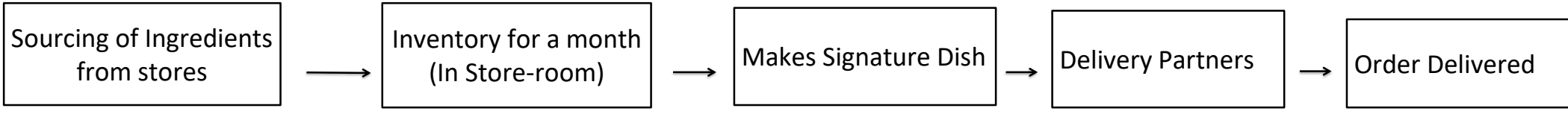
1 MLOps example in Cloud Kitchen Business



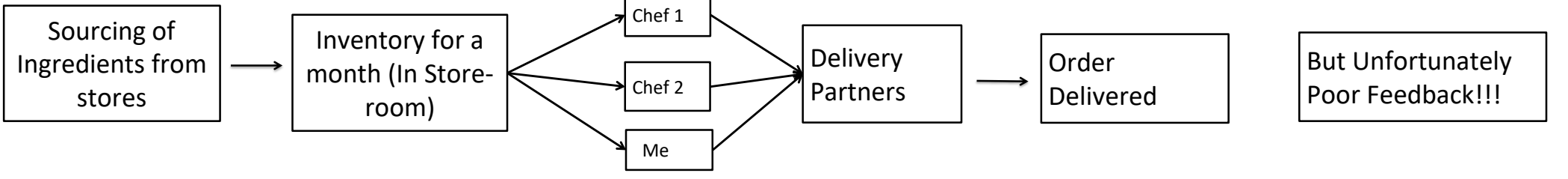
?? Can I start a small business, say food business, and these days there are a lot of delivery partners like Glovo, Just Eat, Uber Eats. Let's start a cloud kitchen then!!
\$\$\$\$###New Business Plan\$\$\$\$###



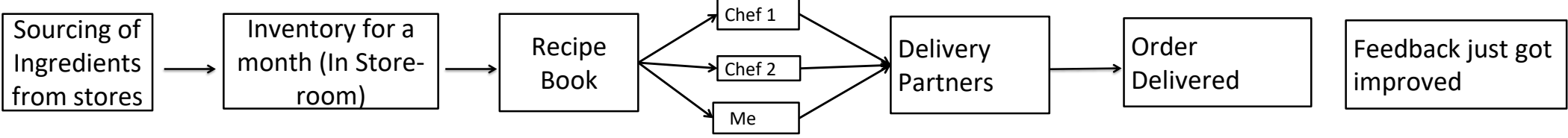
But slowly & slowly 5/6 Orders started to come, and after a month we have 20 Orders per day. So let's make a better plan:



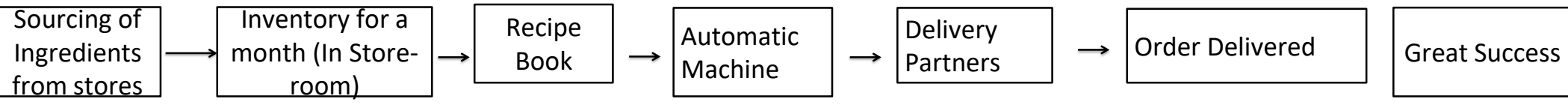
So now time is saved since I don't have to go every time to buy the ingredients. But next challenge: I am getting 100 Orders per day. Let's hire some chefs.



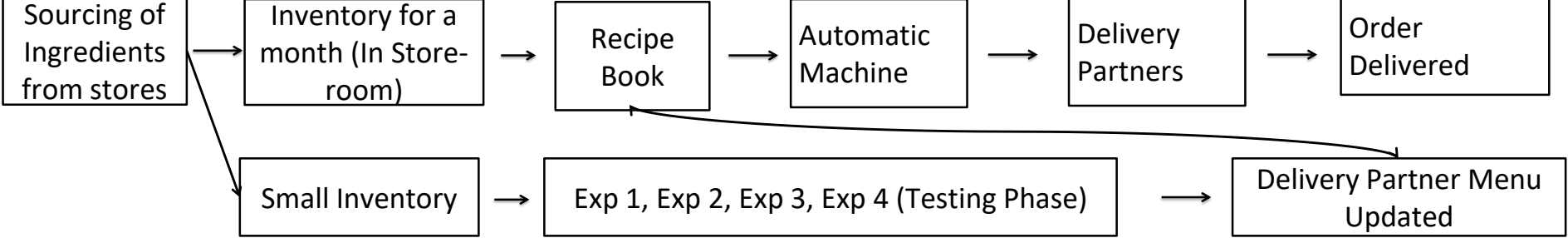
Your cooking is good but Chef 1 and Chef 2 are not satisfactory. Let's make a **Recipe Book** so as to improve the quality (SOP).



Now, **Business Needs Automation**. → Let's introduce an **Automatic Machine** to deliver **1000 Orders per day**



But now my business is getting saturated. → Let's introduce some more dishes in the menu. → And for this, I need **testing of the dishes**. → In testing, I can do experiments with new dishes. **Exp1, Exp2, Exp3, Exp4**



Based on the testing, the **Menu Book** will be updated and the **Machine** will be trained to make new dishes. So **scale-up** is also done, **Continuous Integration, Continuous Delivery** is also achieved.

Tools for MLOps	Data Management & Versioning → DVC (Data Version Control), Delta Lake Version Control → Git, GitHub, GitLab Automation & Model Deployment → Amazon SageMaker, Kubernetes, Docker Experiment Tracking → MLflow, Weights & Biases	CI/CD for ML Pipelines → Jenkins, GitHub Actions, GitLab CI/CD Monitoring & Model Performance Tracking → Grafana Orchestration & Retraining → Apache Airflow, Kubeflow Pipelines
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