HackMTY 2025 – Pick & Pack of the Future
Pillar: *Smart Intelligence*

Productivity Estimation

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gategroup

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Productivity Estimation

1. Understanding the Context

Airline catering operations are highly dynamic environments where precision, speed, and coordination are essential. Every day, thousands of meals, beverages, and service items are prepared, packed, and dispatched according to flight schedules that leave little room for delay. Within this system, productivity plays a crucial role. It determines how efficiently teams can assemble trolleys, prepare drawers, and deliver the right quantities on time.

In areas such as Pick & Pack, employees follow predefined specifications that describe the exact layout and contents of each drawer. These drawers are later placed inside trolleys and loaded onto aircraft. Each specification includes multiple steps: removing the empty drawer from the trolley, positioning it on the workstation, checking the previous contents, replenishing items based on the service plan, and loading the completed drawer back into the trolley. Although these actions may seem simple, together they represent a significant portion of daily labor hours across all catering units worldwide.

Accurately understanding how long it takes to build each drawer is critical for efficient planning. If an operation can predict how much time a specific task requires, it can plan staffing levels, balance workloads, and ensure on-time performance more effectively. For example, drawers containing a larger variety of items or complex arrangements naturally require more handling time than simple, uniform setups. However, these differences are not always captured in current planning tools.

In many catering facilities, productivity is measured manually or with simple ratios such as "drawers per hour per person." While useful at a local level, these calculations are not standardized across regions. One unit might include cleaning and preparation time in its measure, while another focuses only on assembly. This makes it difficult to compare performance globally or identify best practices.

As a result, there is no consistent baseline for what "good productivity" looks like when two employees in different countries are building the same drawer specification. This inconsistency limits the ability to plan accurately, forecast labor needs, and identify improvement opportunities.

The challenge, therefore, is not just to measure output but to estimate it intelligently, to create a way of predicting how long a given task will take based on the characteristics of

the drawer and the context of the operation. For instance, if a drawer specification can be analyzed digitally, it might be possible to calculate an expected completion time in seconds. Over time, such a system could learn and improve, offering valuable insights for global standardization.

Airline catering can be imagined as a blend between a production line and a logistics hub. Every action counts toward ensuring that flights depart on schedule with fully prepared service equipment. A reliable productivity estimation framework would make it possible to optimize workforce allocation, identify inefficiencies, and support smarter scheduling while maintaining the same high-quality standards that passengers expect.

2. The Current Challenge

In today's airline catering operations, productivity measurement and planning are often fragmented, inconsistent, and highly dependent on local practices. Each catering unit develops its own way of tracking how much work is being completed and how efficiently. While this may work within a single facility, it creates major challenges when comparing performance across regions or trying to establish a global standard.

Some units record productivity as drawers or trolleys completed per person per hour. Others use total flight loads, tray counts, or even meal equivalents as their reference. In some cases, support activities such as preparation, cleaning, or replenishment are included in the total time, while in others only assembly time is considered. As a result, two locations performing the same task may appear to have completely different productivity levels simply because they measure them differently.

This inconsistency makes it difficult to identify what good performance actually looks like. Without a clear and standardized approach, operations teams cannot easily compare or benchmark their results. Managers must rely on experience and intuition to decide how many employees to assign to each process or shift. This can lead to overstaffing during certain hours or bottlenecks during peak times.

At the same time, the process of collecting productivity data is often manual and reactive. Supervisors might count the number of drawers produced per hour or estimate how long a task takes based on observation. These methods consume valuable time and are not always accurate, especially in busy environments where multiple activities happen simultaneously. They also provide only a snapshot of performance, not a predictive view of what will happen in the next shift or day.

Another challenge is that not all drawers or specifications are equal. A business-class drawer with 12 unique items arranged in multiple compartments takes longer to assemble than a simple economy-class snack drawer. Yet both are often treated as equivalent in traditional productivity reporting. Without factoring in this variation, the data can be misleading and fail to reflect the true workload of employees.

Furthermore, without standardized estimation models, global or regional management teams cannot easily simulate how changes in menu complexity, workstation design, or automation might affect productivity. This limits the ability to evaluate investments, forecast labor needs, or identify where process improvements would have the greatest impact.

In short, current productivity assessment methods are inconsistent, mostly manual, and lack the ability to predict or explain performance differences between similar operations. The absence of standardized data and estimation tools makes it difficult to plan efficiently, compare units fairly, or scale best practices across the network. A smarter, data-driven approach could transform productivity planning from a reactive exercise into a proactive and globally aligned standard.

3. Your Mission

Your challenge is to imagine how technology, data, or smart logic could transform the way productivity is estimated in the Pick & Pack process. The goal is to create a more intelligent and consistent method for predicting how long it takes to assemble a drawer, depending on its composition and characteristics, without relying on manual measurement or inconsistent local practices.

You are invited to design a concept, model, or prototype that can analyze key elements of a drawer specification and estimate the time required for one employee to complete it. Think of a solution that can be applied across multiple units worldwide, helping managers plan shifts, compare performance, and optimize staffing levels based on real operational data.

Your idea could focus on a digital interface, a mathematical model, or even an AI-powered tool that learns from patterns. For example, a system could analyze the number of items, the variety of product types, and the layout of the drawer to predict an expected duration for assembly. Over time, it could learn from actual data and continuously refine its predictions.

In addition, your concept could explore how productivity estimation connects to broader planning systems. For instance, the results could feed into dashboards, helping supervisors simulate "what-if" scenarios such as adding one more employee to a shift, introducing a new product type, or changing workstation configurations.

In scope:

- Developing a method or tool to estimate drawer assembly time based on drawer specifications or operational factors
- Creating a visual dashboard or interface that displays predicted productivity levels or comparisons across drawers or flight types
- Using data modeling, simulation, or AI to learn from examples and improve estimation accuracy
- Exploring how predictive insights could support workforce planning, training, or global benchmarking

Out of scope:

- Redesigning workstations, physical layouts, or drawer hardware
- Changing product packaging, airline specifications, or menu design

You do not need to build a fully functioning system. A well-structured concept, data model, or prototype that clearly demonstrates how the idea could work in practice is enough. The emphasis is on creativity, practicality, and the potential to turn inconsistent manual measurement into a standardized and predictive productivity framework that can be applied across catering units worldwide.

4. Inspiration and Example Ideas

There are many ways to approach this challenge. The most effective solutions will combine an understanding of operational processes with creativity in how technology and data can be used to support them. Below are a few examples to inspire your thinking. You can use them as a starting point, adapt them, or come up with something completely different.

a. Digital time estimator

A simple digital model or app that predicts the time required to assemble a drawer based on its specification. Users could input details such as the total number of items, the number of unique SKUs, and the drawer category. The tool could then estimate the expected duration in seconds or minutes. This would allow supervisors to forecast total labor needs for upcoming flights more accurately.

b. AI-based learning tool

An intelligent model that learns from real operational data. For example, it could analyze historical assembly times from different drawer types and gradually improve

its accuracy. Over time, it could identify patterns such as which types of drawers consistently take longer and provide recommendations to balance workloads or redesign specifications for efficiency.

c. Predictive planning dashboard

A visualization dashboard that allows planners to simulate different operational scenarios. For instance, it could display how productivity changes if additional employees are added to a shift or if a new flight schedule increases drawer volume. The dashboard could show predicted completion times and alert when staffing levels might be insufficient.

d. Image-based drawer recognition

A prototype that uses image recognition to scan a drawer layout and estimate its complexity. By recognizing how many compartments or item types exist, the system could automatically classify the drawer and predict the likely time required to build it. This could also help standardize classification across regions.

e. Global productivity benchmark tool

A central platform that compares predicted and actual productivity results across different catering units. By applying consistent estimation logic, the system could highlight where performance is above or below expectation and identify best practices that can be replicated worldwide.

f. Simplified simulation model

A lightweight simulation that allows teams to adjust basic variables, such as item count, shift size, or available time, to visualize the impact on total output. Even without advanced AI, this kind of model could help planners understand capacity limits and schedule more efficiently.

A strong idea does not need to be technologically complex. Even a simple model or visual tool that helps standardize how productivity is understood and forecasted can have a major impact on operations. The key is to design something that is realistic, scalable, and easy for catering teams to use in their daily work.

5. Supporting Mock Data

To help you design and test your ideas, you will receive a simplified dataset that represents drawer specifications from the Pick & Pack process in airline catering.

Each row corresponds to one drawer to be assembled by a single employee. The data focuses on the composition and structure of the drawer, describing the type of flight, the drawer category, and the variety of items required to complete it.

Your goal is to use this information to estimate or model how long it might take to assemble each drawer based on its characteristics. For example, drawers with a higher number of unique items or more complex combinations may require longer handling time than simpler setups.

Column	Description	Example
Drawer_ID	Unique identifier for the drawer specification.	DRW_001
Flight_Type	Indicates whether the drawer belongs to Economy, Business, or First-Class service.	Economy
Drawer_Category	Type of drawer, such as Snack, Beverage, Breakfast, or Amenities.	Snack
Total_Items	Total number of items required in the drawer.	28
Unique_Item_Types	Number of distinct product types or SKUs contained in the drawer.	12
Item_List	List of product codes or short names that make up the drawer contents.	SNK01, SNK02, SNK03, DRK01, CUTL01, NAP01

You can use this dataset to analyze relationships, test models, or visualize patterns between drawer composition and estimated build time. For example, you might design a tool that predicts assembly duration from the number of unique items, or a visualization that shows which drawer types are likely to require the most time.

However, using this dataset is optional. You are free to approach the challenge from a different perspective, for example by developing a simulation interface, a visual prediction dashboard, or an AI model that learns from observed task durations. The dataset simply provides a structured way to start experimenting and testing your ideas.

Remember that this mock data represents only a small fraction of what a real catering unit manages daily. In actual operations, thousands of drawers are built each day with varying layouts, menu types, and time pressures. Your solution should be designed with that scale in mind while remaining practical and user-friendly for employees working in fast-paced environments.

6. What Makes a Great Solution

Judges will evaluate your project based on several key dimensions that reflect both creativity and real-world applicability. Your idea does not need to be complex or fully functional, but it should demonstrate clear reasoning, innovation, and a solid understanding of the operational environment.

a. Innovation

How original and creative is your solution? Does it introduce a new way of thinking about productivity estimation or apply technology in a novel way? Judges will value ideas that move beyond traditional measurement methods and show how data, AI, or digital tools can make productivity assessment more intelligent and standardized.

b. Feasibility

Could your solution realistically be implemented in an airline catering environment? Consider the conditions under which employees work: limited space, high time pressure, and repetitive manual tasks. A great solution balances ambition with practicality, showing that it could work without disrupting existing operations.

c. Accuracy and Efficiency

Does your idea help teams understand, estimate, or plan productivity more effectively? Strong solutions will show how predictions or estimations can improve the accuracy of planning, reduce idle time, and optimize resource allocation across shifts or units.

d. Scalability and Standardization

Can your approach be applied across different catering units or adapted to other operational processes? A strong idea will demonstrate how the same logic or model could be scaled globally to bring consistency to how productivity is measured and compared.

e. User Experience

Is your concept intuitive and easy to use for employees and supervisors? Keep in mind that users often work under time constraints and must make fast decisions. A clear, visual, and user-friendly interface will make your idea more practical and impactful.

A great solution is one that combines creativity, clarity, and operational relevance. It should help catering teams better understand how their work translates into measurable output and enable managers to plan smarter, faster, and with greater confidence. Even a simple, well-designed idea that provides new visibility or predictability can have a major positive impact on operations worldwide.

7. Real-World Impact

Imagine your solution being used in large airline catering facilities around the world. Every day, thousands of employees assemble drawers, trays, and trolleys under significant time pressure. Even small improvements in how productivity is estimated and planned could translate into major operational benefits.

A successful system could give planners and supervisors an instant view of how much work each shift can realistically handle. They would know, before the day begins, how long each drawer type is expected to take and how many employees are needed to complete all assemblies on time. During operations, real-time data or predictive updates could help identify where bottlenecks are forming, allowing managers to reallocate staff quickly and avoid flight delays.

For employees, this could mean a fairer and more balanced workload. Instead of relying on rough averages, supervisors could assign drawers based on objective data that reflects their actual complexity. Over time, this transparency could lead to better training, improved motivation, and reduced physical strain.

From a business perspective, standardized productivity estimation would enable global benchmarking. Units in different countries could compare their efficiency using the same model, identify best practices, and share improvement ideas. Management could make more informed decisions about process design, automation investments, and workforce planning.

Beyond Pick & Pack, the same concept could be extended to other areas such as Make & Pack, Wash & Pack, or logistics preparation. A unified estimation model could form part of a broader digital production system, helping to harmonize performance measurement across the entire catering value chain.

In the long term, these insights could reduce costs, improve on-time delivery, and strengthen the overall reliability of airline catering operations. Even small gains in efficiency, when multiplied by thousands of tasks performed every day, could save significant time and resources while maintaining the same high-quality standards passengers expect.

8. Tip for Participants

Do not worry if you have never visited an airline catering facility. You can think of this challenge as a large-scale assembly and production planning problem that must run with extreme precision and speed. The same principles apply to factories, logistics centers, or food preparation environments where multiple small tasks must be completed quickly and consistently.

Focus on understanding the core issue: how to estimate, standardize, and predict the time needed to complete a repetitive manual task based on its content and complexity. In this case, the task is the assembly of drawers in the Pick & Pack area, but the logic can be applied to many other operational contexts.

Try to visualize the environment in which your solution would operate. Employees stand at workstations, moving drawers between trolleys, checking item specifications, and ensuring every layout matches the flight service plan. They work under tight time constraints, often performing hundreds of similar tasks during a single shift. Your solution should make their work easier, not more complicated.

Think about usability and simplicity. A strong idea might not be the most technical one, but rather the one that fits naturally into existing workflows. Tools that provide quick estimates, clear visualizations, or easy-to-use interfaces are more likely to succeed in real-world conditions.

Be creative and explore different approaches. Some of the best ideas might come from combining logic, simulation, and human intuition. You could explore visual dashboards, AI-based estimators, image-recognition models, or even manual tools that help planners standardize timing data. The key is to find a way to bring structure and intelligence to a process that today relies heavily on experience and assumption.

Remember that even small improvements in productivity estimation can create a large impact when applied at scale. A few seconds saved per drawer, multiplied across thousands of drawers per day, can translate into hours of efficiency gains and more consistent performance across global operations.