

WITNESS saves Air France several million Euros per year on its baggage handling costs

Several simulation studies have been carried out for and by Air France in their baggage sorting centres at Roissy Charles de Gaulle 2 (CdG2) airport in France. The main purpose of these studies was to determine resource requirements for the various baggage handling operations. The simulation models were built using WITNESS by trained Air France engineers and by a team of experienced Lanner consultants. The models were run using data recorded day-to-day and provided resourcing estimates that yielded a significant reduction in the number of operator placements. These studies have enabled Air France to negotiate better contract terms with personnel providers, thereby saving several million Euros per year on its baggage handling costs.



WITNESS has helped Air France reduce its baggage handling costs by several million Euros per year.

On 5th May 2004, Air France and KLM merged to become a world leader in air transport in terms of passenger throughput, freight handling and maintenance.

In the 2003-2004 financial year Air France carried 43.7 million passengers. The company reported a turnover of 12.34 billion Euros and a consolidated net profit of 93 million Euros for a market share of 17.3%.

The Roissy/Charles-de-Gaulle hub (CdG2) handles 710 flights and 75,400 passengers every day. 53% of these passengers transfer to a connecting flight and generate an average baggage flow of 26,500 items daily. The flights are organised into six rendezvous slots, each consisting of an arrival wave and a departure wave.

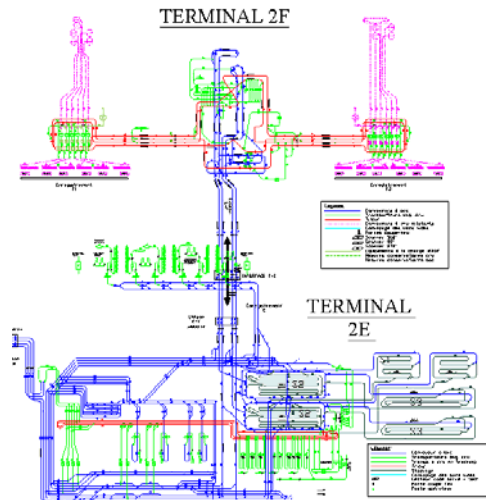
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Company	● Air France
Industry	● Aviation
Application	● Resource Productivity Improvement
Benefit	● Saving of several M€ / year

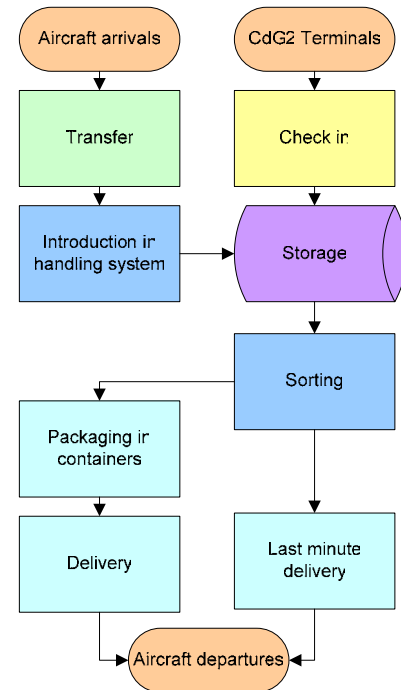
Context

Baggage handling operations at an airport hub such as CdG2 require very considerable equipment and labour resources to cope with flight schedules concentrated into short time slots. Thus, CdG2 will ultimately have 50 km of conveyors linking several different baggage sorting centres. CdG2 has a current requirement for several hundred baggage handling operatives.



Partial single-line diagram of conveyor system with a total length approaching 50 km

Baggage handling involves precise timing of baggage movements for passengers flying out of CdG2 to connect with aircraft departures. Operators are involved at different stages of the process: unloading of aircraft, transfer of connecting baggage to sorting centres, placement on conveyors, manual indexing, containerisation, delivery, etc. Air France outsources these operations to service providers and service contracts are renegotiated on a regular basis. Simulation offers a means of obtaining robust resource estimates tailored to operational requirements, thus providing Air France with effective negotiating tools.



Simplified diagram of baggage handling operations

Model Building and Analysis

Several models were constructed to represent different scenarios, but in all cases the main objective was to determine resource requirements. These models therefore detail all of the tasks calling for the use of operators, taking into account the variables of operating schedules, special handling requirements (such as manual indexing of baggage with illegible labels) and daily fluctuations of baggage flow. These tasks are allocated between different teams of operators and the simulator tracks the number of operators occupied in each of these teams over the course of the day. During the simulation run, the Witness models export these results to Excel. It is then relatively simple to determine the resource allocations required in order to meet the performance commitment.

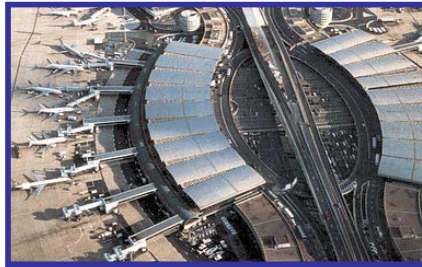
The models use a wide variety of data to describe:

- The physical system (length and speed of conveyor sections, storage capacities, number



of setdown conveyors, etc.). This data was recorded on site for existing facilities or obtained from engineering studies when the facilities were at the design stage.

- Process data (cycle times, work rates, rejection rates at different checkpoints, etc.). This data was recorded on a daily basis over several days.
- Baggage flow inputs to the modelled system. Air France has a connecting flight baggage tracking tool which provides day-to-day indication, for each connecting flight combination (inbound/outbound), of incoming and outgoing flights (with scheduled and actual flight arrival times, parking positions, aircraft type, etc.), the number of baggage items involved, entry location in the system, baggage sorting location, etc. For local baggage, i.e. baggage checked in by passengers in the terminals, this data is not directly available and is therefore reconstructed using a computer program based in particular on passenger check-in profiles by connection slot.



Implementation of the models

Each commercial negotiation with a service provider called for the construction of a simulation model in order to validate their proposed costing. In the past two years, several simulation models have been developed in this way, taking a more or less detailed view of the system (sorting centres in isolation or the CdG2 platform as a whole) and on variable timeframes (current situation or to 2006).

The model simulation and configuration strategy invariably addressed the worst case scenario in terms of operator involvement. In addition, resourcing estimates were made using parameters corresponding to a representative selection of actual days (different days of the week, week-ends with greater or lesser

workload, etc.). These precautions ensure that a credible and robust resource estimate is obtained. Deployment of the simulation-based estimates effectively achieved the expected results.

The same models are also used to address other requirements such as positioning and sizing of container inventories, validation and optimisation of flight allocations to baggage sorters.



Conclusion

WITNESS is actively used by Air France as a support tool for the purchase of baggage handling logistics services. The simulation models developed using this tool have resulted in the establishment of more effective resource solutions than those proposed by service providers. The efficiencies obtained are primarily financial, yielding a saving of several million Euros per year. They also have an organisational dimension in that the service providers are now committed to a constructive process to improve their overall performance.

