

Emerging Dimensions of Technology Management: Airport Technology Management based on Modeling and Simulation

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Airport Technology Management

Technology Management can be introduced as a set of management disciplines that allow organizations to manage their technological developments in order to create competitive advantages. Typically the following major concepts are used in today's technology management:

- Technology strategy, focusing on the relevance of the technology used within the organization.
- Technology forecasting, focusing on the identification of relevant technologies for the organization, which can be achieved through technology scouting. Technology scouting relies on formal and informal information sources, including the personal networks of the scout,
- Technology road mapping, focusing on mapping technologies to business and market needs,
- Technology project portfolio, focusing on a set of projects under development within the organization,
- Technology portfolio, focusing on the set of technologies in use within the organization.

Therefore, the role of technology management within an organization form a general perspective is to understand the value of certain technologies for the organization. Hence, continuous development of technology is valuable as long as there is a value for the clients and therefore technology management within an organization will be able to argue when to invest on technology development and when to withdraw.

The Association of Technology, Management, and Applied Engineering (ATMAE) defines technology management as field concerned with supervision of personnel across the technical spectrum and a wide variety of complex technological systems. Technology management typically require knowledge in production and operations management, project management, computer applications, quality control, safety and health issues, statistics, and general management principles [http://atmae.org]. The complexity beyond this approach suggests that any organization has to master at the very first one level of technology before being able to proceed to the next complexity level. This is a major concern because the modern approach in marketing technology often results in the problem that the technology is being over hyped in the early stages of growth which can raise serious troubles in organizations. Therefore, organizations must decide on trustable technology management strategies to avoid wrong investments, cost expensive redevelopments, time conflicts within the running business, etc. Against this background airport technology management (ATM)

has to follow the forgoing mentioned features running airports as competitive, cost effective, on schedule, and safe civil air traffic facilities.

Computational modeling and simulation in airport passenger information system development

The passenger information system model has to display accurate information on the status of the passenger at check-in in the terminal, security inspection, passport control – if not a domestic flight –, boarding, which can be modeled as workflow based chain function that follow the FIFO queue approach as shown in Figure 1 for the check-in counter.

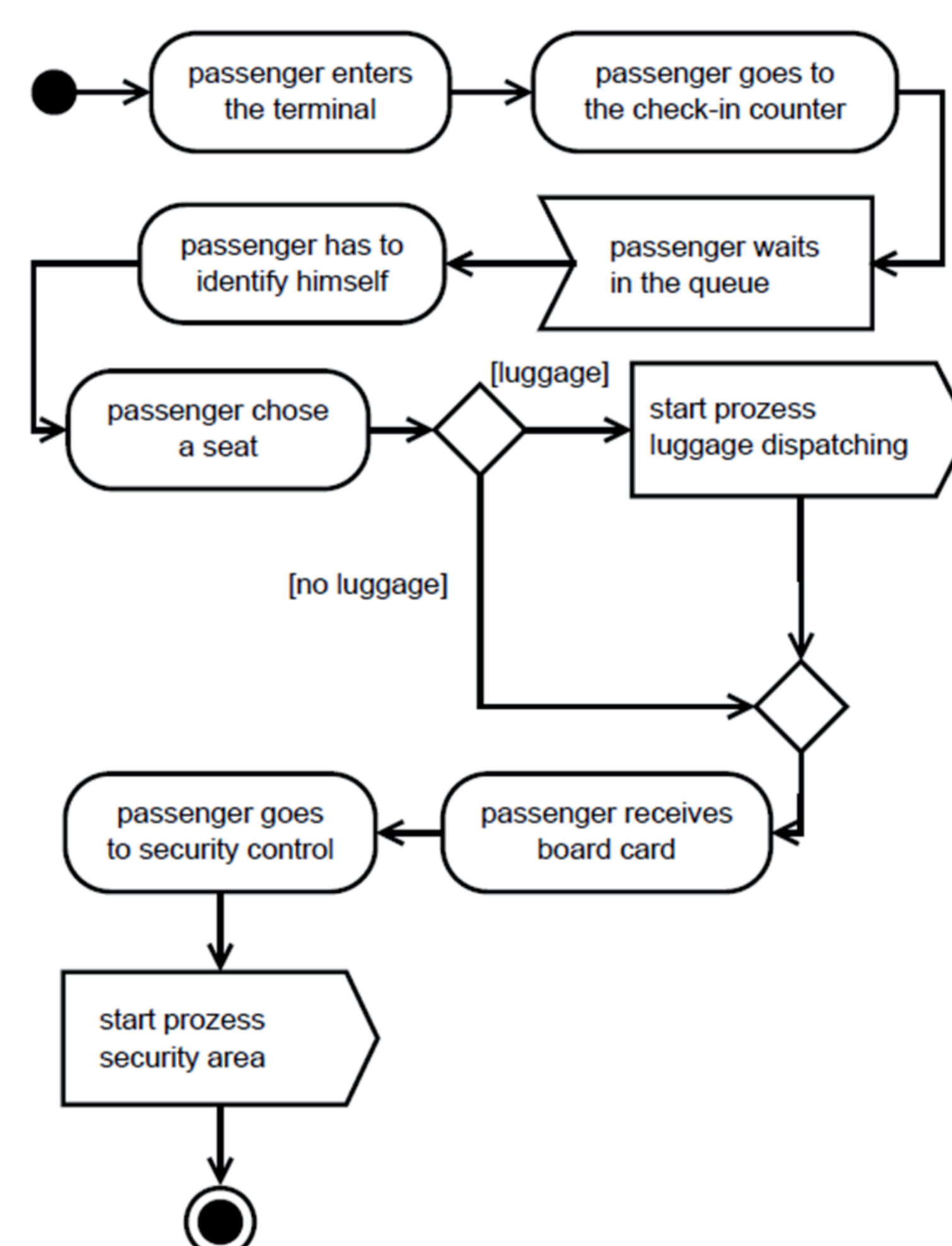


Fig. 1: Passenger at check-in

For simulation studies SimEvents can be used which allow an easy event oriented modeling as shown in Figure 2. From Figure 2 it can be seen that the SimEvent library allows different intrinsic dynamic options for each block. In case of the passenger model at check-in, the passengers wait in a queue at the check-in counter. The intrinsic queue dynamic itself can be modeled as FIFO, LIFO, or a priority queue – like for business and first class passengers –.

Based on the design view developing a passenger model at check-in in Figure 2, the SimEvents passenger departure/subsystem check-in counter is shown in Figure 3.

The revenue passenger emplacement for a 24 h day profile is shown from simulation results in

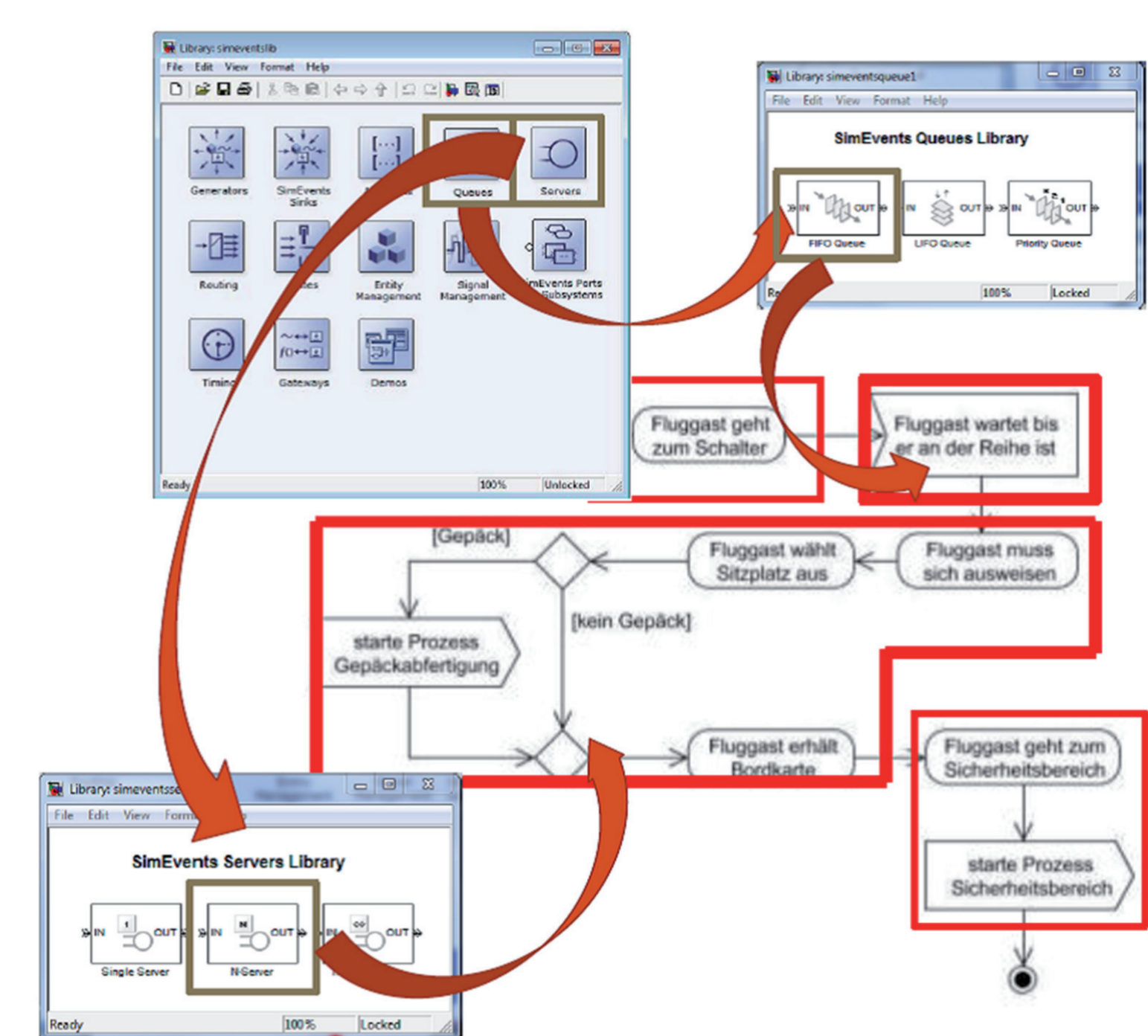


Fig. 2: Development of a passenger model at check-in

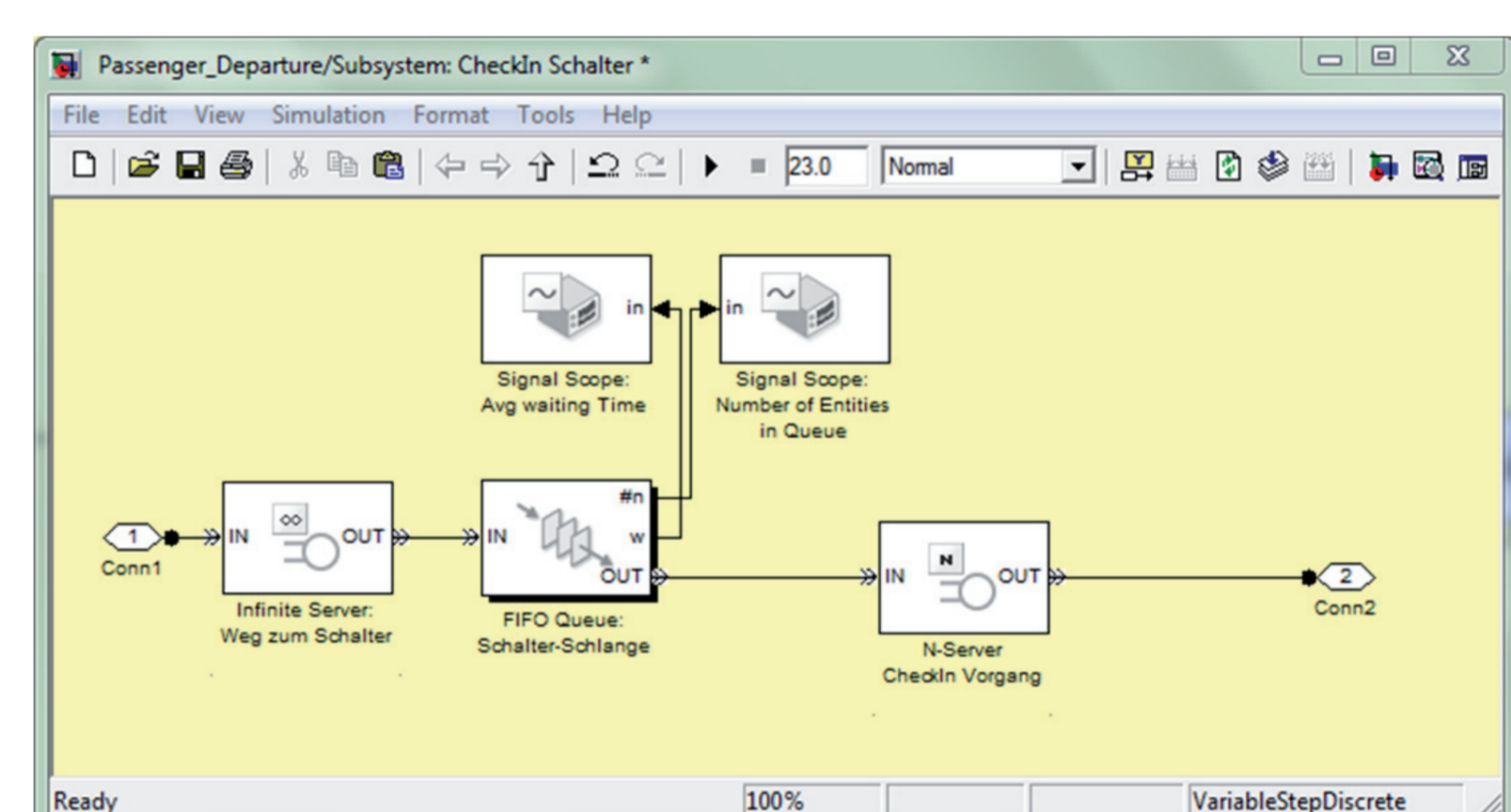


Fig. 3: SimEvents passenger model at check-in

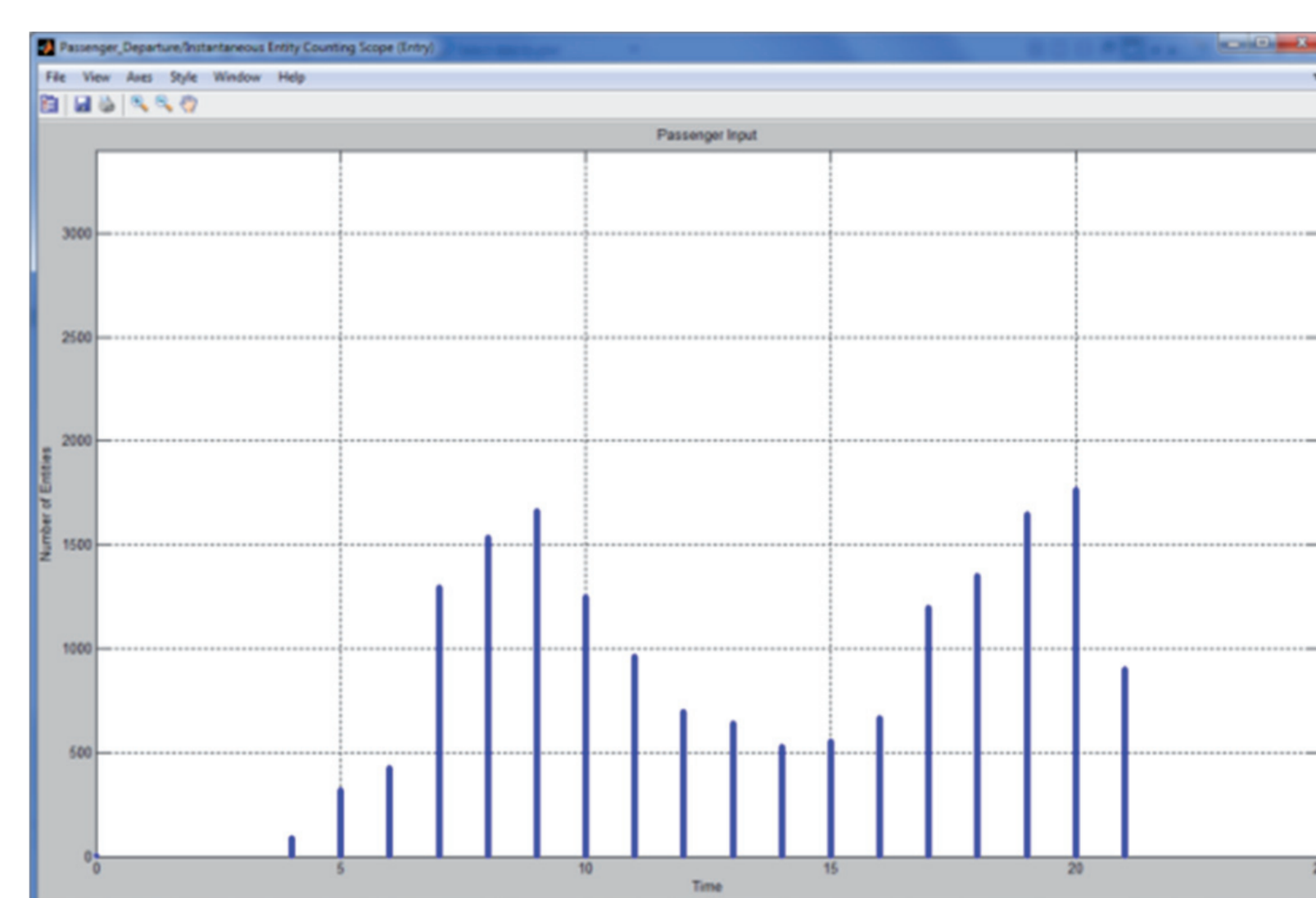


Fig. 4: SimEvents based day profile of passengers at check-in

Figure 4. Based on such models the resources required for growing passenger number can be estimated.

Conclusion

Modeling and Simulation provides an excellent tool for Airport Technology Management to analyze different scenarios - gate management in this case study - wrt the impact of technology and management requirements.