

Factory Simulation Software System

UML DIAGRAMS

GROUP - 6

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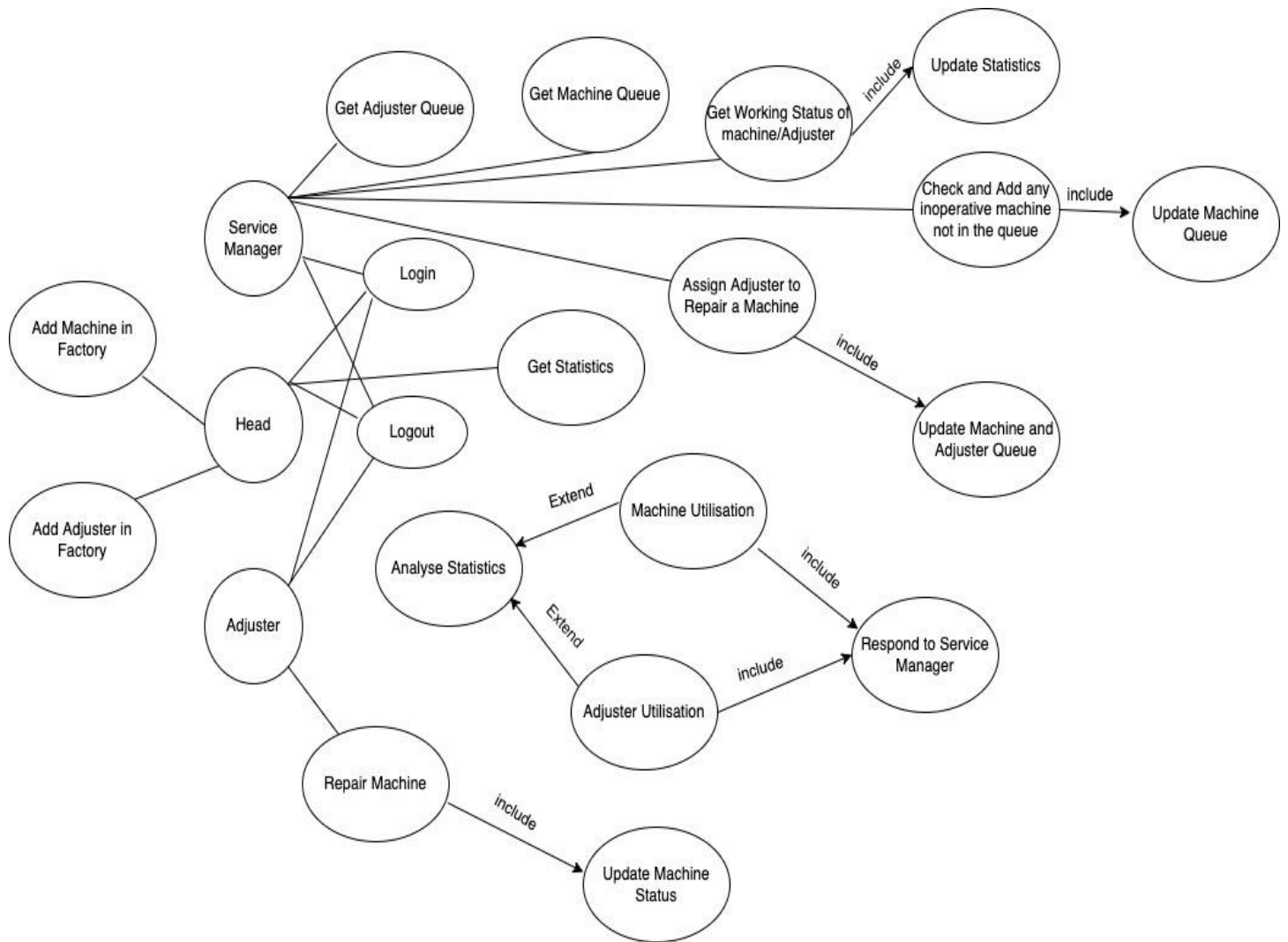
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1. PROBLEM STATEMENT

A factory has different categories of machines such as lathe machines, turning machines, drilling machines, soldering machines, etc. The factory can have different numbers of machines from each category such as 200 lathe machines, 50 turning machines, etc. These machines require frequent adjustments and repair. Each category of machine fails uniformly after continuous operation and the failure profile of the different categories of machines is given by its mean time to failure (MTTF). A certain number of adjusters are employed to keep the machines running. The adjusters have expertise in maintaining different categories of machines. An adjuster may be expert in maintaining more than one type of machine. A service manager coordinates the activities of the adjusters. The service manager maintains a queue of inoperative machines. If there are machines waiting to be repaired, the service manager assigns the machine at the front of the queue to the next available adjuster. Likewise, when some adjusters are not busy, the service manager maintains a queue of idle adjusters and assigns the adjuster at the front of the queue to the next machine that breaks down. At any given time, one of the two queues will be empty. Thus, the service manager needs to maintain only a single queue, which when it is not empty contains only machines or only adjusters. The factory management wishes to get as much as possible out of its machines and adjusters. It is therefore interested in machine utilization | the percentage of time a machine is up and running and the adjuster utilization | the percentage of time an adjuster is busy. The goal of our simulation is then to see how the average machine and adjuster utilization depend on such factors as the number of machines, the number of adjusters, the reliability of the machines in terms of mean time to failure (MTTF). This software would be used by different factories to determine the optimum number of adjusters that they should employ.

2. USE CASE DIAGRAM



3. CLASS DIAGRAM

