



## **How Irene from ISC Manages Critical Services in the Call Center**

*Dr. Leonard J. Forys, Dr. Ashok Errmailli, Dr. Jonathan Wang*

### **Not all Services are the Same**

It inevitably happens in a call center that there is one type of service that is more important than others. Sometimes we charge a premium for some services such as support desks for our products. Perhaps we want to give priorities to new purchasers rather than requests for information. Other times, we have a client who wants to be assured that his/her service is handled with priority. One way to insure better quality service is to set up a special team for the premium service and force it more liberally. This can cause inefficiencies if the premium service has a small call volume. Alternatively, we can combine all services and serve them with a single team, thus gaining large team efficiencies, but setting the target service objective to be the objective of the premium service (e.g. the smallest speed of answer objective). Again, this is done at the expense of agent efficiency. Sometimes however, the ACD permits call centers to give preferential treatment for some queues over others.

### **Priority Queues**

Normally, a team of agents handles multiple queues (each of which may be dedicated to a specific service) by selecting the oldest call among the queues for servicing. Some ACDs allow users to artificially multiply the age of the queue entries by a specified input value. This is sometimes called and “ageing factor”. In other words, we can choose to make calls in our premium queue look twice as old as calls in the other queues. If this is done, the average speed of answer for calls in the premium queue will be half of those in the other queues, irrespective of load condition. In many instances, this is a desirable outcome. However, what should we select for the target answer objective in this case? If we set it to be the target answer objective of the premium service, we have not gained any efficiencies over not having priority queuing, but we will get better service for our premium customers.

### **Gaining Efficiencies through Priority Queuing**

By giving priorities to the premium services, it is possible to gain agent efficiencies while still meeting target answer objectives. We will not describe the mathematics here, but it does require special analysis to determine agent requirements when priorities are in place. The normal Erlang C or Modified Erlang C just won't do. Our workforce management system, Irene from ISC, handles this mathematics for us. As we shall see, it is possible to save on agent requirements in a number of cases by using priority queuing. The amount of savings depends on the particular circumstances. Some examples help clarify the situation.



## **Example 1 – Different Answer Objectives, Medium Sized Team**

Suppose we have the following situation. We have two services, Service 1 and Service 2, and Service 1 is a premium offering requiring priority service. For purposes of an example, let's say that we want that the target Average Speed of Answer for Service 1 should be 10 seconds and that for Service 2 should be 25 seconds. We need to set the "ageing factor" or priority factor for Service 1 five times higher than that for Service 2, to get the kind of answer performance that we want. So, if we set the ageing factor for Service 1 to be 10, we should set the ageing factor for Service 2 to be 10 times less, or 1 (we can also select the ageing factors to be 20 and 2 respectively).

To complete the example, we will assume that the Average Work Times for the two services are the same, three minutes, and that the calling rate for the premium service is 10% of the total calling rate. We will assume that for a specific 15-minute period we expect 500 calls to occur. If we were to split the two services into separate teams, Irene would determine that the premium team would require 14 agents and the team having regular attempts would require 94 agents, for a total of 108 agents.

Suppose we elect to handle both services with only one team of agents, but without any priority queuing. In this case, we have to provide a 10 second average speed of answer for both services, since we cannot differentiate them. Using Irene, we can determine that the required number of agents necessary to provide a 10 second average speed of answer for both services is 107 agents. These agents will be busy about 93.5% of the time. Notice that we save an agent over having two separate teams service two separate queues. In this case, the impact of pooling traffic and serving them with one team of agents outweighs the fact that we are providing better than required answer performance for our regular customers.

If we incorporate priority queuing and ageing factors as described above, Irene determines that you only need 104 agents to meet the target service objectives for both services. What this means is that Service 1 will see, on average, a 10 second average speed of answer while Service 2 will see a 25 second average speed of answer objective. And, compared with a single team with no priority, we save 3 agents. This is a nearly 3% saving (the average time agents are busy is now 95.8%).

## **Example 2 – Different Answer Objectives, Small Team**

If the traffic load is smaller, the results of priority queuing tend to be somewhat better. Consider the same scenario as Example 1, but suppose that instead of expecting 508 calls to occur in a 15-minute period, we expect about 50 calls to occur. In this case, Irene determines that if we were to have separate teams we would require three agents to serve the premium service and 11 agents to serve the regular service, for a total of 14 agents.

If we combine the two services and serve them with only one pool of agents, Irene determines that in order to provide a 10 second average speed of answer for both services, 14 agents are needed. These agents will be busy about 74% of the time. In this particular case, there is no apparent gain from pooling.

If we incorporate priority queuing and ageing factors, Irene determines that you only need 13 agents to meet the target service objectives for both services. This results in a saving of one agent, which is nearly an 8% saving over handling both services with one non-priority pool of agents.



## Example 3 – Larger Differences in Answer Objectives

If the service objectives are more diverse, priority queuing can provide even larger savings. Suppose that in Example 2, we change the target answer objective for Service 1 from 10 seconds average answer to five seconds average answer. In this case, Irene determines that we would require three agents to handle the premium customers and 11 agents to handle the regular customers.

If we were to aggregate the services and handle them with only one team, Irene determines in order to provide a five second average speed of answer for both services, 15 agents are needed. In this particular instance, the benefits of pooling are outweighed by requiring a more stringent grade of service for all customers!

If we incorporate priority queuing and ageing factors, Irene determines that you still only need 13 agents to meet the target service objectives for both services.

## Summary

We have examined a large variety of scenarios where priority queuing is applied. Priority queuing provides agent efficiency gains in all scenarios, but as indicated, the amount of gain depends on several factors. Some general observations can be made about the amount of savings one can expect from using priority queuing:

- ✓ Greatest benefits occur when overall team size is small.
- ✓ Greatest benefits occur when the premium target answer is much smaller than that of the other services.
- ✓ Greatest benefits occur when the average waiting time for premium service is smaller than of other services.
- ✓ Greatest benefits occur when the calling rate of premium service is a small fraction of the total calling rate.

The table below summarizes the results for the three examples that we discussed in this paper.

Example	Premium ASA	Regular ASA	AWT	Calls/15 mminutes	Separate Teams	Combined no Priorities	Combined with Priorities
Medium team	10 sec	25 sec	3 min	50+450	14+94=108	107	104
Small team	10 sec	25 sec	3 min	5+45	3+11=14	14	13
Small team	5 sec	25 sec	3 min	5+45	3+11=14	15	13

**Table 1**



## Other Applications

Irene from ISC can handle priority queuing for service level answer objectives as well as average speed of answer objectives. For example, you can specify that for the premium services, 95% of calls should be answered within 20 seconds, whereas for other services, 80% of calls should be answered within 20 seconds. The determination of ageing factors is more complex in these cases and has to be determined using specialized mathematical programs. The types of efficiency gains are similar to those indicated for average speed of answer objectives.

Although we have only concentrated on two services in this paper, priority queuing applies to cases where we have several different types of services, each with its own target answer objective, or service level objective.

## Conclusion

Priority queuing for premium customers has several advantages. In all instances, it allows for better agent efficiencies (and hence cost savings) while still meeting grade of service objectives. By handling multiple services with one combined team, forecasting tends to be more accurate and performance more predictable.

In order to obtain the gains in efficiencies, the workforce management tools must be able to account for service prioritization.

### About ISC

**ISC** provides Irene, the most advanced workforce management system available to contact centers today. Irene forecasts customer service demand and delivers schedules that support performance targets, agent preferences, and business goals. Irene reduces payroll costs, improve service levels, and increase employee satisfaction. Whether you are managing thousands of agents globally or several dozen agents from one site, Irene meets your needs.

**ISC** was founded in 1973 to provide training development and consulting services to the call and contact center industry. From the beginning, ISC has been dedicated to providing measurable, sustainable improvements in the performance of people, processes, and technologies that shape the customer experience. In 2000, ISC introduced Irene. This award-winning software uses innovative technology that provides unparalleled scalability and dramatic advancements in forecasting and scheduling capabilities for contact center managers.

