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The Ends of Your Economies

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An Interesting Perspective

One of my call center friends is a customer of ours who runs an extremely large network of contact centers. This is a high-tech firm, with management who are very analytically focused. Their contact centers answer somewhere around one to two million calls a week!

We were asked to do a bit of extra analysis at the tail end of a software installation. This customer was trying to determine whether to consolidate their centers and their staff groups. They wanted to know how much money they would save.

I was very surprised to find that this organization did not need to route calls between many of its centers, even though each center handled the very same types of calls as the next. When I asked why this was the case, the answer was obvious: "We're out of our economies."

"We're out of our economies" is not something that you hear very often in the call center world. Currently, most of the contact center companies we talk to are in the process of consolidating centers for the expressed purpose of getting more efficient by gaining economies of scale. Many companies are de-specializing, either through consolidating skills based routing or creating the universal agent. It makes sense, who wouldn't want to get more efficient?

The question that immediately comes to mind is, of course, what are the ends of your economies of scale? At what point do you lose your economies?

Call Centers and Economies of Scale

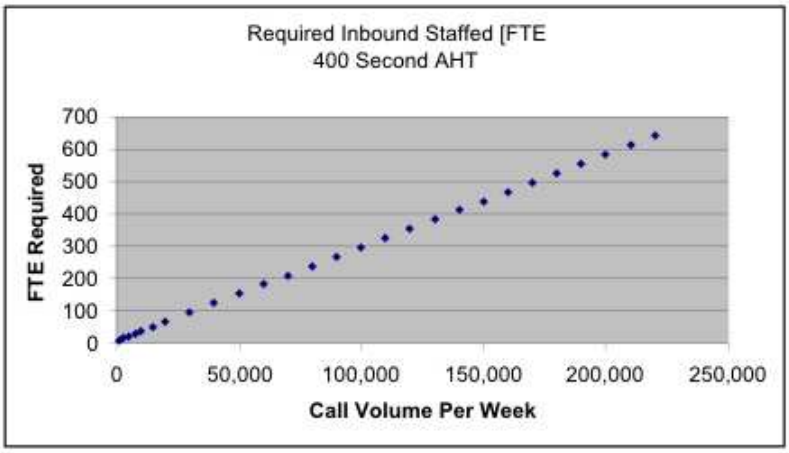
Let's start out by stating the obvious: there are many other areas that economies of scale, or dis-economies of scale, are present, other than just staffing efficiency. We'll discuss this later. But let's start out by analyzing the staffing efficiencies.

Economies of scale are a naturally occurring phenomenon in most production operations. You see it in manufacturing or any other process that has a high fixed startup cost. In an economic definition of economies of scale, the high cost of startup is defrayed, on a per unit basis, by producing more of the good.

The same economics work in the call center world, with an added twist. Because of the (predictable) randomness of call inter-arrivals, there are economies of scale associated with the operation in and of itself. All other things being equal, having more agents on the phone increases the probability of an agent being available when a call randomly comes in. In other words, as the number of agents increase, the number of calls each agent can handle also increases. But only to a point.

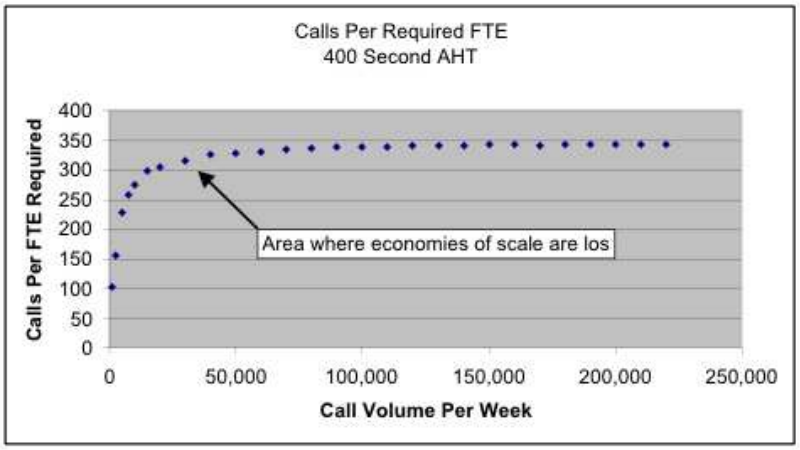
It is the point at which our economies of scale run out that is of particular interest to us workforce management types. That is the point at which it does not gain us any more in efficiency to keep growing a center.

The graph below shows the very common phenomenon of economies of scale at a contact center. As the call volumes increase, the minimum number of staff required to hit a predetermined service standard also increases, and linearly so. The following graph was created using a discrete-event simulation model of a contact center and a service standard of 80 percent answered within 20 seconds. Your requirements will likely look different from these as the simulation model has an assumed customer patience (and resulting abandoned calls) assumption built in, and every call type has different customer patience. Note: because the Erlang equation assumes no abandons, and every contact center is exactly the same using an Erlang equation will always yield the same (slightly off) curve. The following graph demonstrates the classic economies of scale curve.



What is more interesting, however, is the relationship between call volume and calls handled per agent, which truly represents the added efficiency associated with having larger contact volumes and centers.

Graph 2 represents, for the very same contact center network, the relationship between call volume per week and calls handled per week per minimum staff required. That's a mouthful. In non-math math, I divide the agents required to hit my service goals by the number of calls handled. This tells you how productive each agent is over the course of the week.

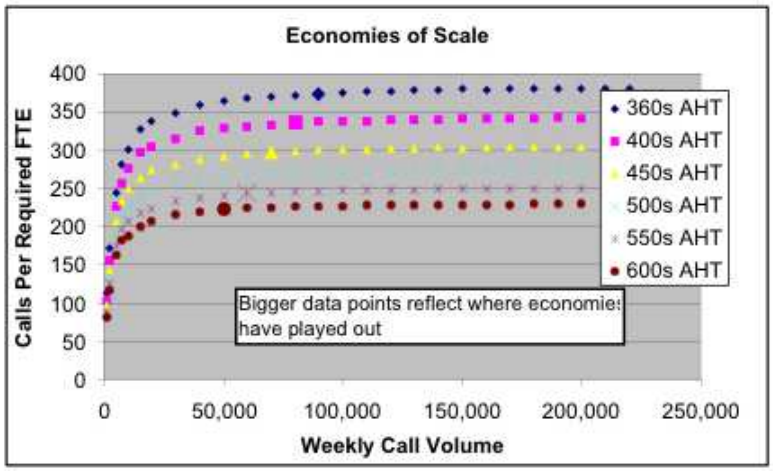


The curve is interesting because it readily demonstrates the natural point where a contact center group is at maximum capacity. In this example, with an average handle time of around 400 seconds, you run out of natural economies at 50,000 calls per week, or roughly 150 rear-ends-in-seats. This was very surprising to me; I would have expected the number to be higher. And it is, sort of. There are other forces at play, which we'll discuss below.

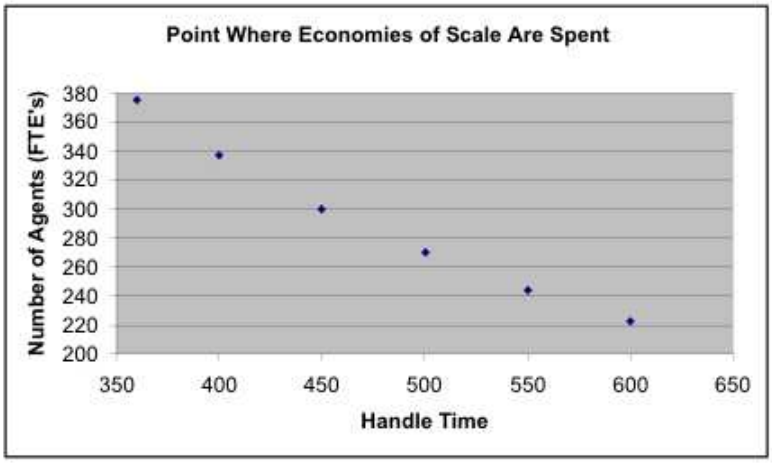
Let's keep going on this. Graph 3 demonstrates the very same relationship for contact center networks with a range in handle times between 360 seconds and 600 seconds. What is great to see is that each of these curves follows the classic economies of scale shape.

What is different for each of the graphs is the point at which the economies are played out. Surprisingly (to me), the economies play out earlier for centers with higher handle times. I would have expected the opposite result. In each graph, I have highlighted the approximate point at which the economies of scale vanish (noted by the bigger data point in each line). To the right of each point, you do not gain much efficiency by growing centers. To the left of each point, you still gain by growing or consolidating your contact centers.

Again, for all of these curves, it is surprising how small the centers are before they run out of economies of scale.



Finally, I plot the individual points at where the economies run out for each handle time modeled. Interesting graph!



Graph 4 simply demonstrates the point at which your economies of scale are spent. For example, if your contact center has a 500 second average handle time, you'd be roughly as efficient, operationally, if you have one center of 540 FTE, or if you have two disconnected centers of 270 FTE each. That seems very counterintuitive!

But I am sure it is correct. These graphs represent the ends of our operational efficiency. It is all straightforward math, and the graphs are what the graphs show.

But I have one caveat.

We have not added financials to the mix, or discussed the other areas of economies of scale associated with our businesses. When determining economies of scale from a financial perspective you might see different results. There are many areas where you get economies of scale associated with consolidating operations: facilities costs, transportation costs, telecom costs, training costs, etc… But often there are dis-economies of scale as well, for instance, it may be harder and more costly to be a major employer in one location compared to a midsized employer in several locations. The cost of risk associated with regional emergencies (i.e. hurricanes) is much greater with a fewer locations compared to decentralized facilities.

All that being said, I am a big, big, fan of universal agents. Creating skills is often an exercise in busy work, adding complexities that do not have to be present. Many times agents are specialized because it sounds good (often to marketing groups), which complicates routing, and management. The ends of your economies should not be a reason to specialize unnecessarily.

Are you ready for the punch line? Remember the SWPP articles about simulation modeling as a tool? Because we had spent the time to put together an accurate discrete-event model of a call center, this entire economy of scale analysis took me 25 minutes to put together.

What are the ends of your economies?

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