



Queue management: Elimination, expectation, and enhancement

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Abstract Queues in a service process represent an unmet customer need and can detract from the value an organization provides. In this article, we present a framework based on three principles for managing customer queues to reduce the discomfort experienced while waiting: (1) eliminate or reduce the wait through process enhancements, (2) manage expectations through timely and relevant communication with one's customers, and (3) enhance the waiting experience. We provide examples of historical and recent innovations along all three dimensions in multiple situations and suggest practical approaches for managers to add additional value to customers while they wait.

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Waiting is frustrating, demoralizing, agonizing, aggravating, annoying, time-consuming, and incredibly expensive.—1980s Federal Express advertisement¹

1. The importance of queues

A queue can be found anywhere there is demand for a good or service that temporarily and locally outstrips the ability of the provider to meet the demand; a queue represents a customer need that is going unmet. Queues grow due to variability in arrival patterns and service times, and long lines may frustrate customers and cause them to seek service elsewhere. Note the quote from the American baseball player and oft-quoted philosopher, Yogi

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¹ Giridhara, A. (2010, August 7). Getting in (and out of) line. *The New York Times*. Available at <http://www.nytimes.com/2010/08/07/world/asia/07iht-currents.html>

Berra: “Nobody goes there anymore. It is too crowded.” Managers often must increase their costs by providing additional service capabilities to address the major causes of customer waiting times: high utilization and excessive variability. Thus, traditional approaches to queue management are either to (1) accept waiting time as unavoidable, (2) add capacity to lower utilization, or (3) attempt to reduce variability. Each approach is costly in one way or another.

Whether it is at a theme park or the department of motor vehicles (DMV), the butcher counter or the grocery checkout counter, on the road or on the phone, waiting for your turn is a part of life. Queues are often connoted negatively in the public’s mind, being associated with the bread lines of the Great Depression, collapsing governments (e.g., 1917 Russia), and other various crises and disasters. Poland’s Institute of National Remembrance released the board game *Kolejka* on the theme; the game is played by standing in line for the necessities on your shopping list while other players with a *Colleague In The Government* card can cut in front of you (Petzinger, 2011). Line waiting can be so onerous for some that they even hire people to do it for them (Elkins, 2015). Long queues can occasionally have positive associations, as with the arrival of a new electronic gadget, a movie, or a book, though the positive association almost certainly does not come from any joy intrinsic to the act of queueing itself. Long queues can sometimes enhance the cachet of a luxury good or exclusive service such as a nightclub, where being seen in the queue is itself a Veblen good. The draw for upmarket streetwear provider Supreme is as much about the wait in line as the merchandise (La Ferla, 2017); as the *Washingtonian* reports (Schaffer, 2017), “Waiting in Ridiculously Long Lines is Washington’s Latest Status Symbol.”

A *Los Angeles Times* article suggested that 5 years of the average American’s life is spent waiting in line (Smith, 1989) and while other research (Stone, 2012) puts the figure somewhat lower, the process is seldom pleasant. Stevenson (2012) suggested that three specific aspects of waiting in queues are sources of unpleasantness: boredom with the wait, unexpectedly long waits, and unfairness in the process. These aspects pertain, in part or in full,

to the psychology of waiting rather than the efficiency of the operation itself, but the operations manager ignores human factors at his/her peril.

Basic operations-management principles can easily address issues of fairness: form one line instead of many; apply first-come, first-served principles (unless an express lane can be formed in a way that everyone finds fair); do not allow line jumping. Innovative approaches to queue management, though, can alleviate or reverse the boredom and manage expectations, making the process less painful for customers and frontline employees via three mechanisms: (1) eliminating or reducing the wait, (2) managing expectations, and (3) enhancing the experience.

Some of these innovations in queue management have been brought about by sheer creativity, with managers finding unexpected ways to solve an age-old problem. Many others though, use emerging technologies to extend the older innovations in new ways, and even the creativity-challenged manager may find ways to apply them to his/her operation.

2. A framework for thinking about queue waiting times

In her article “Breaking the trade-off between efficiency and service,” Frances Frei (2006) addressed the issue of waiting in line through two techniques: accommodation and reduction. The managerial issue becomes one of determining how to accommodate variability, either in arrivals or in service, without increasing costs; or to reduce variability without compromising service. Consider Table 1 as an alternative framework. The idea here is that customers are dissatisfied when waits are longer than expected. The options are to modify the expectations, eliminate or reduce the wait, or enhance the experience so that the wait does not appear so long. Mathematical queueing models can help us predict wait times as functions of key parameters such as number of servers, the mean and variance of arrival rates and service times, and queue discipline. David Maister (1985) wrote about rules of perceived waiting. Judicious application of these rules allows management of both the expectation and the experience of waiting.

Table 1. The 3E framework

Category	Description
(Manage the) <i>Expectations</i>	If the wait is longer than expected, manage the expectations.
<i>Eliminate</i> (or reduce) the wait	If the wait is longer than expected, make the wait shorter.
<i>Enhance</i> the experience	If the wait is currently unacceptable, change the perception and/or value.

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