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# Make Your Service Fail-Safe

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# Make Your Service Fail-Safe

Richard B. Chase • Douglas M. Stewart

One of the most useful concepts of the TQM movement in manufacturing is the application of poka-yoke, or fail-safe, methods to prevent human errors from becoming defects in the end product. Here the authors argue that these methods apply equally well to services and provide a framework for systematically applying poka-yokes to service encounters. They suggest that actions of the system, the server, *and* the customer can be fail-safed, and provide numerous examples to stimulate service managers to think in fail-safe terms. ♣

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Total quality management (TQM) has become accepted practice in services. Concepts from TQM in manufacturing, such as benchmarking, diagnostic tools (fishbone diagrams, Pareto charts, and so on), and customer-driven design (through quality function deployment), have joined with such concepts as service guarantees and service recovery planning to drive the quality philosophies of many service firms. Nevertheless, there remains the monumental challenge of quality assurance when the goal is to achieve zero defects in the day-to-day provision of services. Our objective here is to suggest how another concept with proven success in manufacturing, fail-safing, can and should be applied systematically to services to achieve this goal.[1]

## The Nature of Fail-Safing

The idea of fail-safing is to prevent the inevitable mistake from turning into a defect. The late Shigeo Shingo (known as "Mr. Improvement" in Japan) articulated this basic concept. In his writings, Shingo gave examples of how manufacturing companies have set up their equipment and manual processes to prevent errors in parts counts, sequence of work performance, and product configurations. Shingo's concepts are seen as particularly appropriate where full-scale automation is too costly or is otherwise impractical. According to Hall, "Simple fail-safe methods are the low-cost route to parts-per-million error rates."[2]

The objective of fail-safing is similar to what Taguchi methods have attempted in creating robust products and processes — that is, ensuring that they can withstand the effects of factors beyond the producer's control. We see two main differences between fail-safing and these methods. The first is the relative complexity of Taguchi methods compared to fail-safing: Taguchi methods rely heavily on sophisticated statistical techniques to set optimal product and process parameters. Fail-safing, by contrast, does not require that a specific value be put on process parameters. It requires only the ability to discriminate good from bad. As such, it is easier to apply to intangible service processes.

The second difference is more subtle, concerning the strategy taken by each approach in controlling the process. As mentioned, Taguchi methods strive to make the product or process resistant to factors beyond its control. Fail-safing, instead, governs factors *within* the producer's control and then strives to extend the scope of the control to outside factors.

### Poka-Yokes as Mistake-Proofing

Central to Shingo's approach are inspection and poka-yokes (automatic devices or methods). Shingo defines three categories of inspection, all of which should be done at the 100 percent level. In *successive checks,* the person in the next stage immediately feeds back information to the supplying operator to stop production and fix the error. In *self-inspection,* the operator inspects his or her own work. In *source inspection,* the operator inspects for mistakes that have not yet caused an error.

These inspection practices shorten the feedback loop between when a mistake occurs and its detection and subsequent correction. Immediate feedback is essential for effective process control.

To facilitate the 100 percent inspection process, Shingo uses poka-yoke devices or procedures. Poka-yokes are either *warnings* that signal the existence of a problem or *controls* that stop production until the problem is resolved. The distinction between the two is that warning poka-yokes indicate only that a mistake has been made, while control poka-yokes will force the operator to correct the mistake before proceeding. For example, limit switches are commonly used to indicate when parts are improperly positioned on machines. A warning poke-yoke would be the lights connected to such switches to alert the worker to a misalignment. A control poka-yoke would be the direct connection of the switch to the machine's power source to shut down the machine automatically. (Control poka-yokes have the obvious advantage of being impossible to overlook or ignore.) Although many poka-yokes are equipment based, involving locking clamps, pressure sensors, part jigs, and switches, they can also be procedures, such as assembling kits of parts to ensure that the right number are used or checking lists to ensure that all design steps are followed.

Poka-yokes are either *warnings* that signal the existence of a problem or *controls* that stop production until the problem is resolved.

Shingo further classifies his poka-yokes by three different methods of detecting errors. *Contact* methods rely on the part's physical dimensions to indicate improper dimensions, orientation, or placement. *Fixed value* methods signal that some known quantity of components is not available or has not been used. Finally, *motion step* methods require that some error-prone step in the process must be completed before an obvious step, such as removing the part from the machine, is performed. All of these detection methods can occur as either control or warning methods.[3]

Poka-yoke approaches differ from complex automated inspection systems in that they are designed to be very inexpensive, within the process, and used to stop one particular error each. Additional poka-yokes are added for each additional inspection. (Shingo notes that Toyota Motor's machines are equipped with an average of twelve poka-yokes each.[4])

## Fail-Safing Services

While Shingo's work was primarily production- and product-oriented, involving the manipulation of physical items, service fail-safing is an application of these same techniques (at least at the fundamental level) to service operations. There are two obvious differences between manufacturing and service operations that must be addressed in this new application. First, service fail-safing must account for the customer's activities as well as those of the producer. Customer errors can directly affect the service outcome and must be fail-safed if the service is to be defect-free. In fail-safing the production of a manufactured item, only the actions of the producer (or supplier) are controlled. Fail-safing a customer's actions takes into account only what happens after the customer takes possession of or leaves with the product and is often done for liability reasons, such as the "dead man's" levers on power mowers, which disengage power on the cutting blade if the operator releases the push handle.

Second, many services evolve through multiple forms of interaction between the service company and its customers, which often occur at different locations. Thus, fail-safe methods must be set up for interactions conducted directly or by phone, mail, or through a stand-alone technology like an ATM. Of course, manufacturers confront the same issues in the service side of their business, but their deliverable is a physical product.

These differences lead us to focus on applying fail-safe principles to the front-office activities of service organizations. Of course, great improvements can be made by fail-safing the back-office activities as well (and we provide several examples). But we believe the really critical area is where the customer and the system interact. Here we find amazingly little in the way of design principles to make even the most basic encounters error-free. The back-office problem is much simpler — the customer isn't there — and hence it lends itself to the application of established fail-safe approaches from manufacturing.

## Classifying Service Poka-Yokes

There are already numerous examples of service poka-yokes that either have been suggested or are in use.

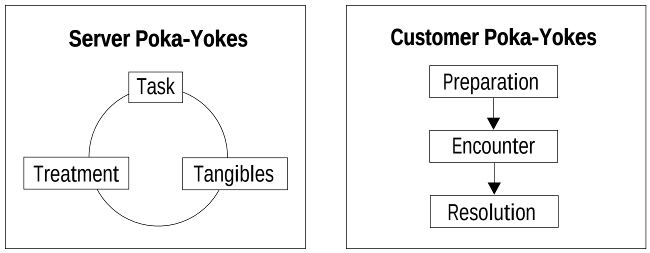



**Figure 1 Poka-Yoke Classification**

Theodore Levitt, an early pioneer, suggested applying manufacturing approaches to services. Citing examples from the highly successful McDonald's of the 1960s, Levitt proposed using machinery and clever devices, akin to Shingo's poka-yokes, to create consistency in service delivery. He also hinted that the organization might even be able to exhibit some control over customer actions.[5]

What is missing from Levitt's work and the literature on services in general is a fail-safing framework that can be used to guide systematic poka-yoke development across a wide range of services. Hence, we propose that service poka-yokes be classified instead by the type of error they are designed to prevent.

Errors in services can be divided first into *server errors* and *customer errors.* Server errors can be further classified as errors in the task, the treatment, or the tangible aspects of service, while customer errors can be classified as errors in the preparation for the encounter, the encounter, or the resolution of the encounter (see Figure 1).

The "three T" breakdown is critical to our approach for fail-safing the server because it explicitly relates fail-safing actions to specific dimensions of service. A limitation of previous efforts to "engineer" services has been the failure to recognize that each of these facets can be addressed separately for improvement purposes. A widely used instrument (SERVQUAL) for measuring service quality identifies five critical dimensions of service: reliability, responsiveness, assurance, empathy, and tangibles.[6] Though valuable for marketing analysis, the definitions of the SERVQUAL dimensions tend to confound attitude and action and, hence, are of limited value in analyzing operations.[7]

While "the customer is always right," he or she is also frequently error-prone. In fact, research done by TARP, a service research firm, indicates that one-third of all customer complaints are related to problems caused by the customers themselves.[8] We do not present this finding as a way for management to justify poor service but, rather, to indicate that companies need to develop processes that eliminate the foul-ups leading to complaints. We need to find tools to help the customer do things right.

Unlike the server, the customer generally does not view the service as a continuous stream of encounters in which all necessary materials and knowledge are kept close at hand. For customers, there is preparation for the encounter, the encounter, and a resolution to the encounter. Nevertheless, because of the customers' integral role in the service, their actions should be fail-safed at each stage to ensure that the service works as designed.

Perhaps the best way to gain an understanding of what service poka-yokes are, and how they are used as process control, is through examples. Here we provide examples of each poka-yoke category. The common feature of each example is a built-in inspection process to either warn or prevent mistakes from becoming defects.

## Fail-Safing the Server

**Task Poka-Yokes.** Task errors are those in the service functions such as the repair shop not repairing the car properly or promptly. These include doing work:

- Incorrectly.
- Not requested.
- In the wrong order.
- Too slowly.

The many examples of poka-yoke devices to detect and avoid task errors include computer prompts to aid in technical discussions, strategically placed microphones to ensure that server's and customer's voices are audible, color-coded cash register keys, a change tray on top of the cash register, appropriate measuring and weighing tools (such as McDonald's french-fry scoop), and signaling devices. Sewell Cadillac and other similar facilities use color-coded tags or icons on car roofs to identify the customer's service adviser and order of arrival. The adviser can look out across the sea of cars and find the next car he or she should deal with.[9]

Due to the extreme cost of their errors, hospitals are heavy users of poka-yokes in their direct medical processes (though they seem less widely used in activities surrounding patient care, such as scheduling and billing). Trays for surgical instruments have indentations for each instrument, and all of the instruments for a given operation are nested in the tray so it is clear if the surgeon has not removed all instruments from the patient before closing the incision. Similarly, all gauze used during the operation is contained in a fixed number of small packages to facilitate counting the packages before closing. All material needed to insert a catheter is included in a kit, itself a poka-yoke because any unused item remaining in it, such as the syringe for inflating the catheter, signals an improper procedure or installation. On the medication cart, each patient's medication is prepackaged in the correct dosage before it is placed on the cart. If the nurse, after making rounds, has any remaining medication, a doctor must rectify the situation.

**Treatment Poka-Yokes.** Treatment errors occur in the contact between the server and the customer, such as lack of courteous, professional behavior. Specific examples of this type include the failure to:

- Acknowledge the customer.
- Listen to the customer.
- React appropriately to the customer.

Standard treatment poka-yokes in particular contexts are signals, such as eye contact, to acknowledge a customer's presence in a restaurant, candy distributed before a plane takes off, and a bell on the shop door. A major hotel chain uses a novel poka-yoke to fail-safe acknowledging a guest's repeat business. When the bellman greets an arriving guest to bring in his or her luggage, he asks if this is a first visit. If the guest says he or she has been there before, the bellman will discreetly tug on his ear, so the clerk at the front desk will then greet the guest with a hearty "Welcome back!"

A bank ensures eye contact by requiring tellers to record the customer's eye color on a checklist as they start the transaction. Similarly, some companies place mirrors next to customer service reps' phones to fail-safe a "smiling voice" to their unseen customers. A Korean theme park uses a more controlling poka-yoke: it sews the pockets of its new employees' trousers closed to ensure that they maintain formal decorum (i.e., no hands in their pockets).

Many service companies train their personnel to read customers' negative nonverbal cues early in the encounter. This inspection helps the employee to prevent miscommunication from escalating into a full-blown service failure. For some day-to-day service situations, behavioral-management-based standards and rewards can be used to specify the actions that aid in mistake-proof treatment. For example, a fast-food restaurant listed "friendliness" as one aspect of front-line employee behavior that it wished to fail-safe. Rather than mandating that employees "smile all the time," the trainers provided four specific cues for when to smile: when greeting the customer, when taking the order, when telling the customer about the dessert special, and when giving the customer change. The restaurant encouraged employees to observe whether the customers smiled back — a natural reinforcer for smiling. Employees also learned opening lines, ranging from information about food to inquiries about customer preferences. Incidentally, Luthans and Davis advocate applying the approach only to those 20 percent of behaviors that affect 80 percent of the quantity and quality of service.[10] It is tempting to disparage such behavioral management as simply Skinnerian manipulation, but when properly executed, the approach has led to positive results for both the server and the served. Luthans and Davis document success with the approach in such services as banking, real estate sales, and drug and department stores.

**Tangible Poka-Yokes.** Tangible errors are those in the physical elements of the service, such as dirty waiting rooms, incorrect or unclear bills, and so on. Such errors are caused by failure to:

- Clean facilities.
- Provide clean uniforms.
- Control noise, odors, light, and temperature.
- Proofread documents for content and presentation.

There are many examples of poka-yokes to prevent tangible errors. A mirror placed where a worker can automatically check his or her appearance before greeting a customer fosters a neat appearance. To prevent people from sleeping in their facilities, bus and train stations, airports, and similar facilities can install chairs with fixed armrests to make it impossible to lie down. Hotels can wrap paper strips around towels to help the housekeeping staff identify the clean linen and show which towels should be replaced. For proofing, most software programs have built-in checks for spelling and arithmetic errors. W.M. Mercer, a consulting firm specializing in benefits and health care, uses peer review — systematic auditing by pairs of its associates — of all reports. Motorola's legal department performs similar double-checking with its "two lawyer rule." A second lawyer reviews all aspects of the legal work, memorandums, oral presentations, contract drafts, and so on.[11]

### Fail-Safing the Customer

**Preparation Poka-Yokes.** Customer errors can occur before the encounter, both inside and outside the service facility. Specific examples of this type of error include failure to:

- Bring necessary materials to the encounter.
- Understand and anticipate their role in the service transaction.
- Engage the correct service.

During the encounter, marketing can use poka-yokes for shaping prior expectations and informing the customer on how to access the service. For example, Digital

Equipment marketers put a poka-yoke in a flier sent to DEC customers to prevent preparation errors. The flier uses a simple flowchart to specify how to place a service call. By guiding them through three "yes or no" questions, it ensures that customers have the necessary information (e.g., their equipment model) and that they contact the appropriate provider to obtain service.

Other preparation poka-yokes are dress code requests on invitations, reminders about dental appointments, and bracelets inscribed with the wearer's special medical condition.

**Encounter Poka-Yokes.** Customer errors during an encounter can be due to inattention, misunderstanding, or simply a memory lapse. Such errors include failure to:
• Remember steps in the service process.
• Follow system flow.
• Specify desires sufficiently.
• Follow instructions.

Some poka-yoke devices and procedures that warn and control customer actions are chains to configure waiting lines, locks on airline lavatory doors that must be turned to switch on lights (and, at the same time, activate the "occupied" sign), height bars at amusement rides to ensure that riders do not exceed size limitations, turnstiles, frames at airport check-in counters so passengers can gauge the allowable size of their carry-on luggage, beepers that signal customers to remove their cards from the ATM, and so on. Even symbols employees wear can be warnings. Trainee buttons, badges, and gold braid are standard signals that shape expectations about service before the employees take any actions.

An example of a low-cost technology for fail-safing is the use of pagers at the three-hundred-seat Cove Restaurant in Deerfield Beach, Florida. Since there is often a forty-five-minute wait for a table, the maître d' provides customers with small pagers that vibrate when activated from the master seating control board at the host stand. This allows guests to roam outside without missing their table call. The system cost about $5,000.[12]

In another example, a dentist, whose office is in a mall, loans parents a similar pager so that they can shop while their child is being treated. And for customers who don't want to stroll around, a bar across the street from the Denver Department of Motor Vehicles has an inexpensive electronic display board showing the queue numbers for waiting motorists. Drivers can play pool, shoot darts, and have a soft drink while waiting for their licenses. A retailer uses an electronically preset cash register that can be adjusted to reduce the number of keystrokes necessary when it sells a limited variety of items during a sale. The device keeps the line moving and avoids congestion at checkout. A simple poka-yoke can help customers who pay with credit cards and take the wrong copy of the receipt. Some cashiers fold the top edge of the receipt back, holding together the restaurant's copies while revealing the customer's copy. Another restaurant poka-yoke is using a circular coaster to indicate which diner gets decaffeinated coffee.

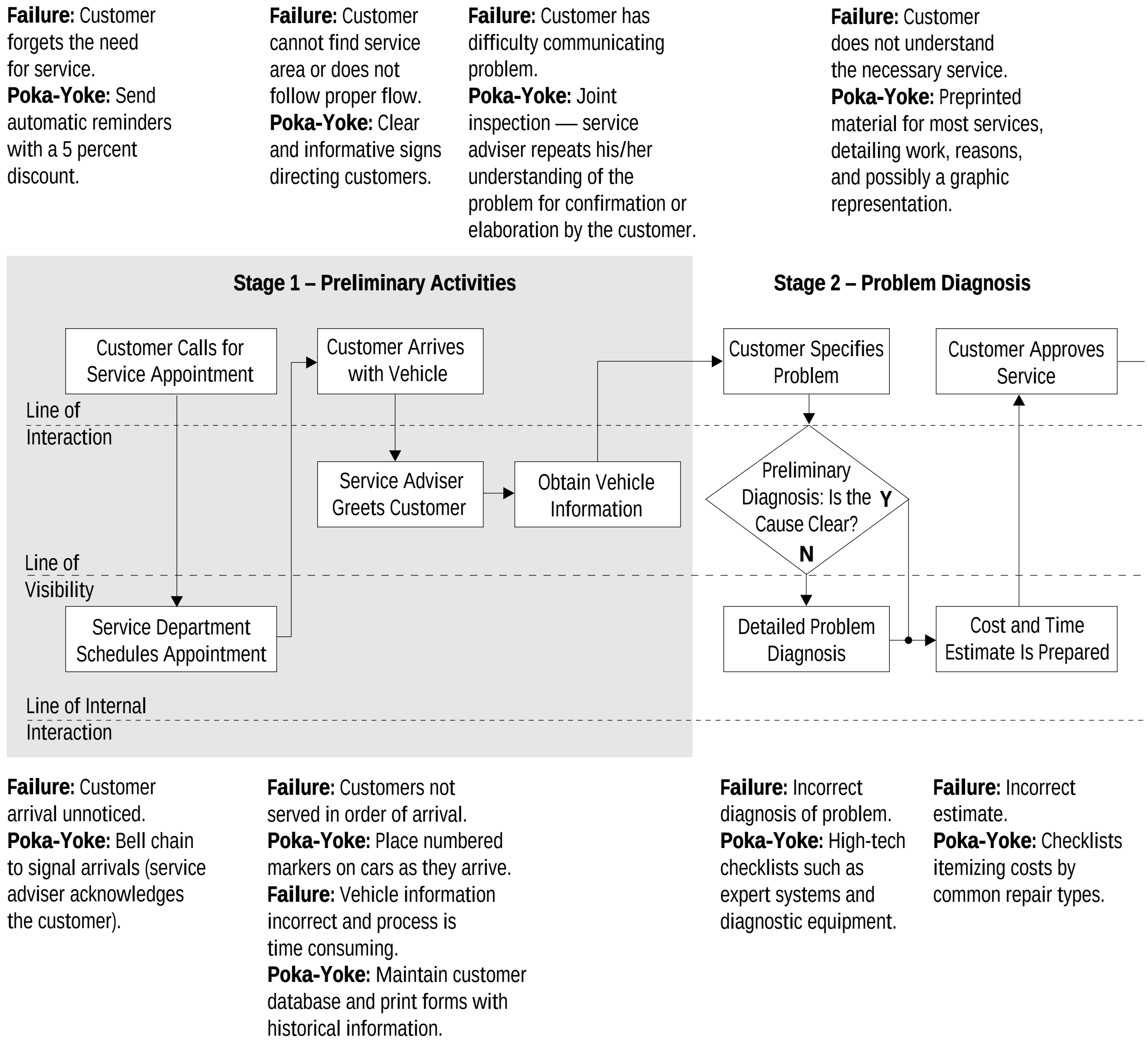
Many service encounters occur on the phone. The most common mistake cable TV companies face in their telephone troubleshooting happens when customers report a supposed reception problem when, in fact, they have inadvertently changed the channel setting on their TV. However, if a service representative asks the customer if his or her TV is "on the correct channel," the customer will often feel embarrassed and automatically say "yes." One company uses a multistep fail-safing process to instruct the customer to "turn the channel selector from channel 3 (the correct setting) to channel 5, and then back to 3." This ensures that the customer performs the check, while preventing him or her from feeling inept.[13]

> Marketing can use poka-yokes for shaping prior expectations and informing the customer on how to access the service.

**Resolution Poka-Yokes.** Customers may also make errors at the resolution stage of the service encounter. Following the encounter, the customer typically evaluates the experience, modifies expectations for subsequent encounters, and, ideally, provides feedback to the service provider. A range of errors can occur in this process, including failure to:
• Signal service failures.
• Learn from experience.
• Adjust expectations appropriately.
• Execute appropriate post-encounter actions.

For example, hotel management may include a comment card plus a certificate for a small gift in its bill envelope to encourage the guest to spend the time to provide feedback. Child-care centers use toy outlines on walls and floors to show where toys should be placed after use. (In fact, a child-care consultant advocates placing photographs by the door to show children what a "clean" room looks like.) At the University of Pennsylvania, the food service director encourages students to

**Figure 2 Fail-Safing a Typical Automotive Service Operation**



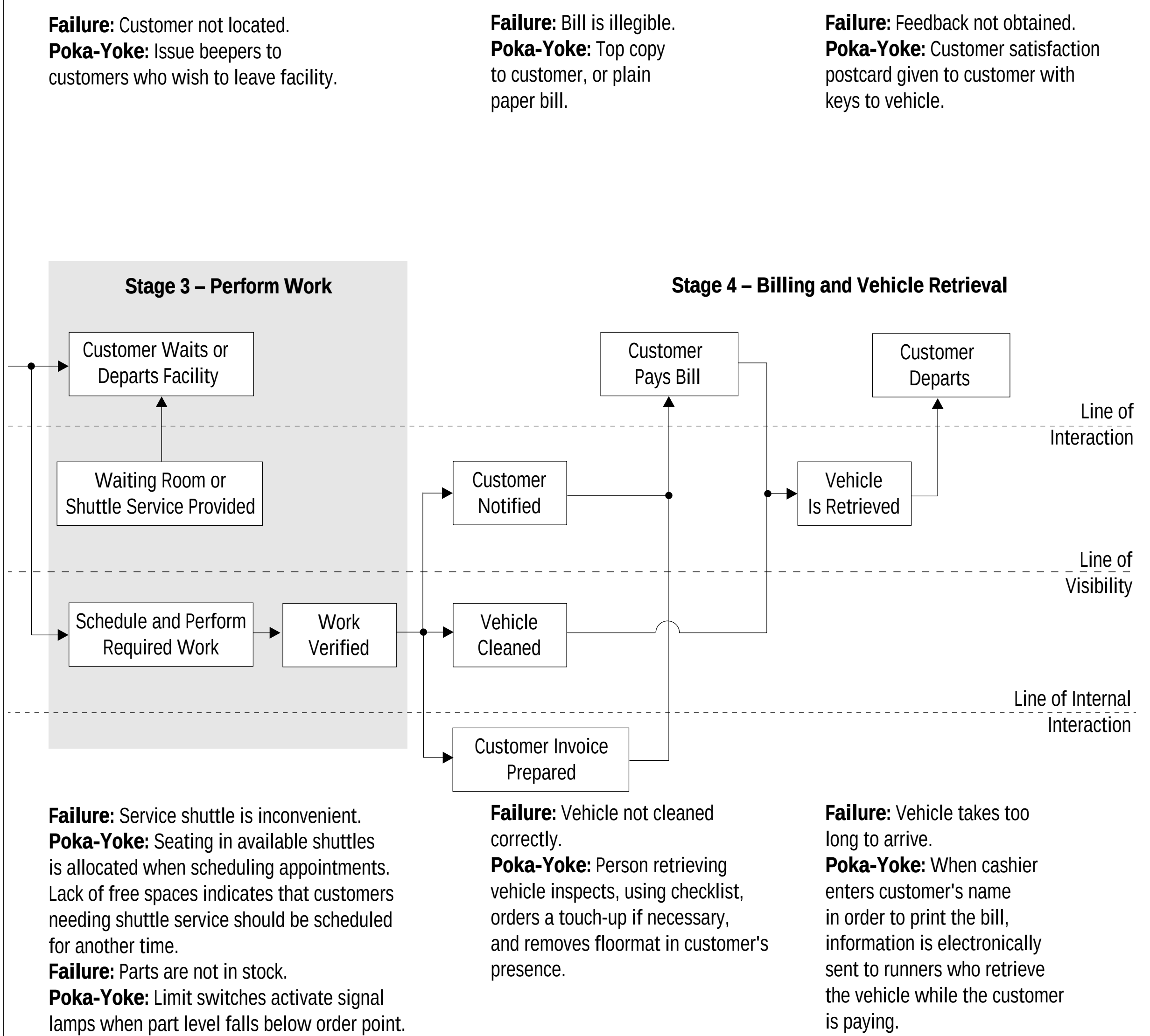

register complaints using "bitch boards" posted at all food service facilities. In fast-food restaurants, strategically located tray-return stands and trash receptacles remind customers to return their trays.

The bathrooms at L'Hotel Louis XIV in Quebec provide an example of a clever poka-yoke. Because the bathrooms were shared by two rooms, problems arose when a guest forgot to unlock the door leading to the other room. The hotel installed a poka-yoke to replace the locks on the bathroom doors. Since the doors, on opposite sides of the bathroom, opened out into the guest rooms, it connected a leather strap to the handles on each door. A guest in the bathroom was to hook the straps together, thus holding both doors shut. It was impossible for the guest to leave the bathroom without unhooking the strap and thus unlocking both doors.[14]

## General Steps in the Fail-Safing Process

The first step in fail-safing is to review each stage of the service process and identify where and when failures occur. In practice, there are two places where problems are most likely. One, obviously, is during the provision of one-on-one service; the other is when the customer is handed off to another person or stage of the service process. For any service, a blueprint can trace the processing steps and the information flow between the customer and the server.[15] The information flow should

Figure 2 (continued)




include such items as the directions the customer receives, the customer's service request, and the nature of customer feedback. Separating the front- and back-office environments is the line of visibility. This line indicates those process steps where customers can see defects. The handoffs between the customer and the server occur across a line of interaction. Similarly, lines of internal iteration indicate handoffs between various servers in the back office. Generally, a "fresh pair of eyes" can detect the mistakes during handoffs.

Once a mistake is detected, the next step is to trace through the process to find its source. One could conceivably cross several lines (visibility and interaction) many times before locating the source.

The final step is to set up a fail-safe system to block each mistake from turning into a defect. Juran calls this step "error cause removal." This may call for source inspection, self-inspection, or sequential checks as defined earlier, or it may call for what we term "joint inspection," involving both customer and server. For example, the server could repeat an order back to a customer to ensure that the correct information was accessed, exchanged, and understood.

### Fail-Safing a Typical Automotive Service Operation

Now let us look at how to fail-safe an existing service operation. Figure 2 shows a simplified version of standard service at a car dealership, starting when the customer calls for a service appointment and ending when the customer leaves the facility. The complete blueprint for this operation is much more complex, including capacity and time control activities, warranty claims processing, customer credit approval, and the possibility of additional mechanical work, but this simplified version is suitable for illustration. We have indicated four stages, each including various failpoints and suggestions for preventing errors.

• **Stage One.** The first stage consists of scheduling the appointment and all of the preliminary activities such as greeting the customer and obtaining the vehicle information. A potential failure arises if the customer forgets the appointment. To preclude this, a fail-safe procedure is to call the customer the day before the intended service.

After arrival at the facility, the customer may be unable to locate the service department. Clear, informative signs will prevent the customer from getting lost. The next failure can occur if the service adviser fails to notice the customer's arrival. This is a particular problem during slow periods when the service advisers may be performing other duties, such as checking on the progress of other cars. A drive-over signal, such as the bell chains found in old full-service gas stations, will ensure that the customer receives attention.

> Managers are missing a good bet by not starting to fail-safe in parallel with traditional quality initiatives.

If this is a large service facility with many service teams, the dealer can overlook customers and serve them out of turn, particularly in the morning rush. Numbered color-coded tags, such as those Sewell Cadillac uses, can be placed on the cars, identifying the service team and order of arrival.[16]

Errors also occur in recording the vehicle information for the work order. Most people who come to an automobile service facility are repeat customers, so their vehicle information (with the exception of mileage) remains the same each time. By maintaining a customer database, the dealer can preprint forms with this background information, decreasing errors and the work load.

• **Stage Two.** At the problem diagnosis stage, one of the first errors is incorrect diagnosis due to poor communication between the customer and service adviser. A good fail-safe method for overcoming this is joint inspection, in which the service adviser repeats his or her understanding of the problem for the customer to confirm or elaborate on.

Even with a good understanding of the problem, the service adviser can still err in diagnosing its cause. A fail-safe system can be a high-tech checklist such as an expert system to guide the adviser's referral of repairs or problems to a mechanic for exploratory diagnosis. Expert systems and computer-assisted diagnostic equipment can also support the mechanic's decisions.

Once the adviser diagnoses the problem, he or she must complete a cost and time estimate. A checklist, possibly computerized, that itemizes the costs by common repair types or procedures (such as dashboard removal) will prevent errors in this step.

The last step in this stage is the customer's approval of the required work. If customers do not understand the service and why it is necessary, they may think they are being taken advantage of and may refuse the service, which can result in severe damage to the vehicle or injury to the customer. To prevent errors in understanding and decision making, the service adviser can provide preprinted material for most services, detailing the work, the reasons for the work, and possibly a graphic representation. (This is in addition to a careful explanation.)

If the customer has left the facility, he or she needs to be located after the cause of the problem has been determined, to approve the needed service. Many customers leave a telephone number where they can be reached; however, some customers, such as sales and service representatives, students, and those just running errands, may not know where they will be during the day or cannot be phoned during working hours. Giving a beeper to these customers as they leave the facility is a good poka-yoke to ensure that they can always be contacted directly and allows them to call back when they can get to a phone.

• **Stage Three.** During the work stage, the customer and the vehicle take different paths. The customer proceeds to the waiting room or takes a service shuttle to home or work, while the vehicle goes to the service bays (the back office). As the car moves into the back office, out of the customer's sight, the work becomes production, rather than service, oriented. Although poka-yokes are able to provide great benefits in the back office, their application is very similar to those in Shingo's manufacturing environments. One example from manufacturing, which can be used in the stockroom, ensures that miscellaneous parts are not out of stock. Dealerships can use computerized inventory control systems that track most of the parts in the service area and indicate when the parts department manager should reorder or even reorder automatically. Some miscellaneous parts are commonly used in a large variety of repairs, but, for various reasons, are not worth tracking individually in the inventory system. If the parts manager fails to notice when the stock level of these parts is low, running out can seriously disrupt operations. A poka-yoke to prevent this error involves limit switches in the part bins, placed so that a signal lamp lights up to prompt reordering when the level falls below a certain point.[17]

Meanwhile, the customer has found that the service shuttle schedule is overbooked or inconvenient (e.g., going uptown when he or she needs to go downtown). When the dealership traces the problem back through the process to find the source of the error, it finds that the customer was scheduled for an appointment at the wrong time (i.e., when too many other shuttle riders, or riders who were heading uptown, were scheduled). A poka-yoke can include the shuttle's schedule in the appointment log. When a customer makes an appointment, the service adviser can quickly check the availability of seats in the shuttle and its direction of travel and reserve a place for the customer.

• **Stage Four.** The final stage in the service delivery process involves billing and reuniting the customer and vehicle. If customers have left the facility, they must be located, perhaps using the beeper system discussed earlier. When the customer arrives at the cashier, he or she may find the invoice illegible, and, if it is a carbonless copy, it may grow increasingly more so over time. A simple fail-safe is to either provide the top sheet for the customer or, now quite common, use plain-paper invoices printed on a laser printer.

To ensure that the car arrives promptly after the customer has paid the bill, a dealer can use a motion step poka-yoke. At Sewell Cadillac, when the customer arrives at the cashier, the cashier electronically notifies a lot lizard (vehicle retrieval specialist) in the holding lot when entering the customer's name into the billing computer. The lot lizard then retrieves the car while the customer is paying.[18]

Before returning the vehicle to the customer, the lot lizard can use an itemized checklist to ensure that it has been properly cleaned by the car wash crew. If the vehicle is not up to standard (e.g., fingerprints on the hood or door that did not come off when washed, or spots from an unfriendly bird who discovered the car), it is returned for a quick touch-up. If the dealership has an automatic carwash, the car can go through the wash as it goes from the holding lot to the customer. As an extra fail-safe, the lot lizard can remove the protective floormat and plastic seat cover in the customer's presence to communicate that the mechanics took proper precautions to ensure cleanliness. In essence, the server facilitates the customer's inspection process and makes service quality visible.

The final step in any service is to obtain performance feedback. One way of ensuring this is to provide a postage-paid questionnaire along with the keys to the vehicle. Sewell Cadillac uses a very short questionnaire (three questions with space for comments) for customers to complete while waiting for the billing and payment to be processed.[19]

All these fail-safe devices and procedures can drastically reduce or eliminate the errors they were designed to detect. In addition, a dealership can quickly introduce almost all of them at little or no cost. That most of the procedures seem trivial is actually the beauty of fail-safing. It does not require highly trained quality practitioners; indeed, given a basic understanding of the fail-safing process, any employee can contribute to fail-safing the service delivery system.

## Conclusion

Managers need to think about specific actions to take for achieving the first principle of quality — doing it right the first time. All books on quality advocate this in chapter one, but no book or article provides any detailed theory and examples on how to do this for services. While we are in favor of creating quality cultures, continuous improvement processes, quality training in statistics, and the like, we think managers are missing a good bet by not starting to fail-safe in parallel with these traditional quality initiatives. Current TQM theory, as practiced in manufacturing, usually places fail-safing downstream, lumped in with the other activities that quality improvement teams pursue. But in services, fail-safing is a product design decision. Thus, it must be included up front — at the start of any quality improvement effort. Moreover, even reengineering efforts that are information-technology-driven can benefit from poka-yokes, because defects in order entry, for example, can disrupt a vast computer network in no time.

Designing poka-yokes is part art and part science. Our framework to systematize their development is a modest, practical approach to making immediate improvements in service delivery. The success of fail-safing in manufacturing, coupled with examples from services, suggests that service managers should consider it seriously.[20] ◆

**References**

1. We believe that fail-safing has decided advantages over the other

logical choice for service process control, statistical process control (SPC). This is due to the humanistic nature of services, which makes them particularly prone to human error. As a statistical method, SPC is designed to ignore random variation and signal statistically significant events. Human error is, however, a random event and thus will be ignored by SPC. (In SPC terminology, human error will become part of the common cause variation.) Therefore, if SPC cannot detect human error, then it will not be able to control its effect on the service process.
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5. T. Levitt, “Production-line Approach to Service,” *Harvard Business Review,* September-October 1972, pp. 41-52. Levitt reveals how, to keep its surrounding property clean, McDonald’s placed numerous conspicuously colored trash cans throughout the parking lots. The assumption was that customers would not litter while looking at an obvious trash can only steps away.
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7. SERVQUAL is primarily a measurement tool, and, although its dimensions represent important aspects of the service in the eyes of the customer, they do not directly relate to the activities of the server. This is because the SERVQUAL dimensions were obtained by disaggregating a perceptual construct, service quality, into factors that best explained different perceived levels of quality, rather than by grouping the fundamental observed components of the service delivery system into larger more homogenous categories.
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11. R.E. Yates, “Lawyers not Exempt from Quality Crusade,” *Recrafting America* (Chicago: Chicago Tribune Company, 1991).
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14. R. Caplan, *Why There Are No Locks on the Bathroom Doors in Hotel Louis XIV and Other Object Lessons* (New York: McGraw-Hill, 1984).
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16. Sewell and Brown (1990).
17. Nikkan Kogyo Shimbun/Factory Magazine, ed., *Poka-Yoke: Improving Product Quality by Preventing Defects* (Cambridge, Massachusetts: Productivity Press, 1988), p. 100.
18. Sewell and Brown (1990).
19. Ibid.
20. Services could benefit from a compendium of poka-yoke examples similar to those compiled for manufacturing in:
Nikkan Kogyo Shimbun/Factory Magazine (1988).

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