***Poka-yoke*** *(POH-kah YOH-kay) is an approach for mistake-proofing processes using automatic devices or methods to avoid simple human error.*

Poka-yoke is focused on two aspects: (1) prediction, or recognizing that a defect is about to occur and providing a warning, and (2) detection, or recognizing that a defect has occurred and stopping the process. Many applications of poka-yoke are deceptively simple, yet creative. Usually, they are inexpensive to implement. One of Shingo’s first poka-yoke devices involved a process at the Yamada Electric plant in which workers assemble a switch having two push buttons supported by two springs.16 Occasionally, the worker would forget to insert a spring under each button, which led to a costly and embarrassing repair at the customer’s facility. In the old method, the worker would take two springs out of a large parts box and then assemble the switch. To prevent this mistake, the worker was instructed first to place two springs in a small dish in front of the parts box, and then assemble the switch. If a spring remains in the dish, the operator knows immediately that an error has occurred. The solution was simple, cheap, and provided immediate feedback to the operator. Many other examples can be cited:

• Machines have limit switches connected to warning lights that tell the operator when parts are positioned improperly on the machine.

• A device on a drill counts the number of holes drilled in a work piece; a buzzer sounds if the work piece is removed before the correct number of holes has been drilled.

• Computer programs display a warning message if a file that has not been saved is to be closed. Computers are also designed so that the correct cord can only be plugged into the correct socket.

• Passwords used for Web accounts are often entered twice.

From this discussion and examples, we see three levels of mistake-proofing with increasing costs associated with them:

1. *Designing potential errors out of the process.* Clearly, this approach is the most powerful form of mistake-proofing because it eliminates any possibility that the error or defect might occur and has no direct cost in terms of time or rework and scrap.

2. *Identifying potential defects and stopping a process before the defect is produced.* Although this approach eliminates any cost associated with producing a defect, it does require the time associated with stopping a process and taking corrective action.

3. *Finding defects that enter or leave a process.* This approach eliminates wasted resources that would add value to nonconforming work, but clearly results in scrap or rework.

Richard B. Chase and Douglas M. Stewart suggest that the same concepts can be applied to services.17 The major differences are that service mistake-proofing must account for the customers’ activities as well as those of the producer, and for interactions between the customer and provider. Chase and Stewart classify service poka-yokes by the type of error they are designed to prevent: server errors and customer errors. Server errors result from the task, treatment, or tangibles of the service. Customer errors occur during preparation, the service encounter, or during resolution. The following list summarizes the typical types of service errors and related poka-yokes.

*Task errors* include doing work incorrectly, work not requested, work on the wrong order, or working too slowly. Some examples of poka-yoke devices for task errors are computer prompts, color-coded cash register keys, measuring tools such as a French-fry scoop, and signaling devices. Hospitals use trays for surgical instruments that have indentations for each instrument, preventing the surgeon from leaving one of them in the patient. Simple checklists are often used; for example, LifeWings, a company that applies flight-tested safety lessons from the aviation industry to medicine, works with medical teams to create standardized lists of activities for every procedure.18

*Treatment errors* arise in the contact between the server and the customer, such as lack of courteous behavior, and failure to acknowledge, listen, or react appropriately to the customer. A bank encourages eye contact by requiring tellers to record the customer’s eye color on a checklist as they start the transaction. To promote friendliness at a fast-food restaurant, trainers provide the four specific cues for when to smile: when greeting the customer, when taking the order, when telling about the dessert special, and when giving the customer change. They encourage employees to observe whether the customer smiled back, a natural reinforcer for smiling.

*Tangible errors* are those in physical elements of the service, such as unclean facilities, dirty uniforms, inappropriate temperature, and document errors. Hotels wrap paper strips around towels to help the housekeeping staff identify clean linen and show which ones should be replaced. Spell-checkers in word processing software help reduce document misspellings (provided they are used!).

*Customer errors in preparation* include the failure to bring necessary materials to the encounter, to understand their role in the service transaction, and to engage the correct service. A computer manufacturer provides a flowchart to specify how to place a service call. By guiding the customers through three yes-or-no questions, the flowchart prompts them to have the necessary information before calling.

*Customer errors during an encounter* can be due to inattention, misunderstanding, or simply a memory lapse, and include failure to remember steps in the process or to follow instructions. Poka-yoke examples include height bars at amusement rides that indicate rider size requirements, beepers that signal customers to remove cards from ATM machines, and locks on airplane lavatory doors that must be closed to turn on the lights. Some cashiers at restaurants fold back the top edge of credit card receipts, holding together the restaurant’s copies while revealing the customer’s copy.

*Customer errors at the resolution stage* of a service encounter include failure to signal service inadequacies, to learn from experience, to adjust expectations, and to execute appropriate post-encounter actions. Hotels might enclose a small gift certificate to encourage guests to provide feedback. Strategically placed tray-return stands and trash receptacles remind customers to return trays in fast-food facilities.

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