Even experts sometimes make mistakes, and many of these mistakes are preventable.

This simple idea is at the heart of The Checklist Manifesto, the latest book by Atul Gawande. In it, the Harvard-trained doctor and New Yorker staff writer argues that our modern workplaces have become too hectic and complex for our fallible human brains to handle.

Consequently, expert decision-makers of all kinds – including doctors, airline pilots, engineers and venture capitalists – can no longer be trusted to consistently remember even the most basic steps that are required to consistently do their jobs well. In other words, where acquiring and relying upon highly specialized expertise used to be enough to assure success in most professional endeavours, that’s no longer the case.

Saying that experts can no longer be trusted to run the affairs of the world is a rather inflammatory point to make. Of course, regular readers of Atul Gawande’s articles on healthcare in The New Yorker will know that he’s not one to shy away from controversy.

Not unlike his authority-challenging colleague at The New Yorker, Malcolm Gladwell, Gawande is able to get away with saying very provocative things now and then because he has an uncommon knack for melding the rigorous, no-nonsense investigative methods of a scientist with the charm of an old fashioned story teller. In other words, he’s good at backing up his opinions with facts, and he knows how to make a story fun.

Since his time in graduate school during the late 1970s, Gawande has been deeply interested in the question of why experts fail. For years, Gawande struggled to understand how it is that white collar experts (and surgeons in particular) have amassed such stupendous know-how – which allows us to accomplish so many extraordinary things – yet all too often, we still make terrible mistakes.

Society has invested its collective wisdom and know-how in the hands of some of the most highly trained, conscientious, and hardworking people in our society. Yet, avoidable failures by so-called experts are common across every field of endeavour, from medicine to finance, and business to government. Eventually, Gawande came to realize that the volume and
complexity of what we know has exceeded our individual ability to deliver its benefits correctly, safely, or reliably. Our knowledge has both saved us and burdened us.

If developing mastery and expertise alone is no longer enough, as Gawande argues is the case, then we need a different strategy for avoiding failure. We need a strategy that builds on experience and takes advantage of the immense knowledge we all have in our brains, and in our hands, but also makes up for our inevitable human inadequacies.

According to Gawande, there is such a strategy, although he would be the first to admit it seems almost ridiculous, and perhaps even a bit crazy, in its simplicity. As you’ve no doubt already guessed (given the title of Gawande’s book), that strategy is a checklist.

In the pages that follow, we’ll hear Gawande’s arguments for why checklists are actually applicable to a wider variety of situations and workplace environments than you might have previously considered; we’ll look at how to overcome resistance to checklists (particularly by experts who may claim they’re unnecessary); and finally we’ll learn how to develop new checklists from scratch, hearing examples from the airline industry and elsewhere.

The Burden of Knowledge

According to Gawande, there are two key reasons why experts sometimes fail. The first reason is simple lack of knowledge, or ignorance. Now, granted, ignorance isn’t the problem it once was. Here we are in the first half of the twenty-first century, and we know how to build massive skyscrapers, predict snowstorms, and save people from heart attacks. Humanity has come a long way in terms of our mastery of science and the liberal arts. Yet, as Gawande reminds us, our mastery of these and other areas remains considerably incomplete. There are still skyscrapers we do not yet know how to build, snow storms we cannot predict, and heart attacks we don’t know how to stop.

The second reason experts sometimes fail is ineptitude. Even in those instances where near perfect knowledge exists, we may still neglect to apply it correctly. Perhaps we arrived at work sleep deprived, or distracted because we’re thinking about a sick relative, or worrying about financial problems at home. On one of those fateful days, if we make a critical error, the skyscraper might get built wrong, eventually leading to its collapse.

When Gawande sat down to write his book, he was struck by how greatly the balance of ignorance vs. ineptitude has shifted over just the last few decades alone. “For nearly all of history, people’s lives have been governed primarily by ignorance,” explains Gawande. “This was nowhere more evident than with the illnesses that befell us. Experts knew very little about what caused diseases such as Polio or cancer, nor what could be done to remedy them. But amazingly, over just the last few decades, science has filled in enough knowledge to make ineptitude as much our struggle as ignorance.”

If you doubt how far we’ve come in just a few years, consider how we used to deal with heart attacks versus how we treat them today. According to Gawande, even as recently as the late
1950’s, we had little idea of how to prevent or treat heart attacks. We didn’t know about the dangers of high blood pressure, and even if we had been aware of those dangers, we wouldn’t have known what to do about it. The first safe medication to treat hypertension was not developed and used to prevent disease until the 1960’s. We didn’t know about the role of cholesterol either, or genetics or smoking or diabetes.

Today, by contrast, doctors have at least a dozen effective ways to reduce our likelihood of having a heart attack. For instance, by controlling our blood pressure, prescribing medication to lower cholesterol and inflammation, limiting blood sugar levels, encouraging regular exercise, helping with smoking cessation, and, if there are early signs of heart disease, getting us to a cardiologist for still further recommendations. And if we should have a heart attack, we have a whole panel of effective therapies that can not only save our life, but also limit the damage to our heart.

We now have clot-busting drugs that can reopen blocked coronary arteries; we have cardiac catheters that can balloon them open; we have open heart surgery techniques that let surgeons bypass the obstructed vessels; and doctors have learned that in some instances all they really have to do is send us to bed with some aspirin and blood pressure medications, and after a couple of days we’ll generally be ready to go home and ease gradually back to our usual routine.

Of course, these improvements are not only limited to the field of medicine. Humanity’s know-how and sophistication have increased across almost all realms of endeavour, and as a result, the burden placed on professionals of keeping up with all this knowledge has grown exponentially. We see the troubling effects of this knowledge burden in the mistakes that authorities occasionally make when hurricanes or other disasters hit without warning. We see it in the 36 percent increase over the last decade in lawsuits against attorneys for legal mistakes, with the most common being simple administrative errors, like missed calendar dates. We see it in flawed software design, in foreign intelligence failures – in fact, in almost any area built on large amounts of knowledge.

According to Gawande, the medical profession’s answer to the knowledge burden problem has been to go from specialization to super-specialization. Gawande writes: “Expertise is the mantra of modern medicine. In the early twentieth century, you needed only a one-year medical degree to practice medicine. But by the century’s end, all doctors had to have a college degree, a four-year medical degree, and an additional three to seven years of residency training in an individual field of practice, such as paediatrics or neurology.

In recent years, though, even this level of preparation has not been enough for the growing complexity of medicine. After their residencies, most young doctors today are going on to do fellowships, adding one to three further years of training, say, laparoscopic surgery, or radiology, or critical care.” One obvious consequence of all of this training is that a young doctor is not so young nowadays. A new doctor typically doesn’t start in independent practice until her mid-thirties.
Yet, despite all these years of diligent training and practice, doctors still make mistakes. Lots of mistakes. Americans today undergo an average of seven operations in their lifetime, with surgeons performing more than fifty million operations annually. We continue to have upwards of 150,000 deaths following botched surgeries every year, which is more than three times the number of U.S. traffic fatalities. Virtually all of these deaths and major complications are avoidable, argues Gawande. It isn’t a question of ignorance. The knowledge exists. But however supremely specialized our doctors have become, steps are still missed. The burden of our knowledge is simply too great.

**Checklists for Complicated Environments**

In a high-pressure, complicated environment, such as a surgical operating room, experts are up against two main difficulties. The first is the fallibility of human memory and attention, especially when it comes to routine matters that are easily overlooked under the strain of more pressing events. (As Gawande points out from first-hand experience, when you’ve got a patient throwing up and an upset family member frantically asking you what’s going on, it can be easy to forget that you have not checked the patient’s pulse.)

Indeed, faulty memory and distraction are a particular danger in what engineers call “all-or-none processes.” Whether you’re running to the store to buy ingredients for a cake, preparing an airplane for takeoff, or evaluating a sick person in the hospital, if you miss just one thing, you might as well not have even tried at all. There is no room for error.

The second key difficulty, which Gawande believes is just as insidious, is that experts can sometimes lull themselves into deliberately skipping steps even when they remember them. Even in highly regimented work environments, such as operating rooms, experts have been known to tell themselves that certain steps don’t matter. For example, it’s standard operating procedure to check for four vital signs before commencing a medical procedure. But measuring all four vital signs generally uncovers a worrisome issue only in one out of fifty patients. So doctors sometimes skip one of the signs. “This has never been a problem before,” they tell themselves. Until one day it is.

According to Gawande, in complicated, but highly regimented environments, checklists can provide protection against such mental failures. They remind us of the bare minimum necessary steps in any procedure by making them explicit. They not only offer the possibility of verification but also instil a discipline of higher performance; or at least a check against laziness. They catch mental flaws inherent in all of us – flaws of memory and attention. And because they do all this, says Gawande, they should be mandatory.

At this point you may be thinking, “Sure, checklists might work well in process-heavy environments, like hospitals, but checklists presumably have limits too. Some situations are simply too chaotic, too complex and too creative to be scripted.” Is that true?

To probe this question, Gawande visited with two professors who study the science of complexity. Brenda Zimmerman and Sholom Glouberman – both based out of Toronto, Canada
– have proposed a distinction among three different kinds of problems in the world: the simple, the complicated, and the complex. Simple problems, they note, are ones like baking a cake from a mix. There is a recipe. Sometimes there are a few basic techniques to learn. But once these are mastered, following the recipe brings a high likelihood of success. Simple problems lend themselves very well to checklists.

Complicated problems are ones like performing a triple bypass, or sending a rocket to the moon. Yes, there are tons of steps to be followed, and a great deal of expertise is required. Yet, even complicated problems can often be broken down into a series of simple procedures. Ultimately success requires multiple people, and often multiple teams, working together. Unanticipated difficulties may arise along the way. Timing and coordination become serious concerns. But still, checklists can deliver great results.

Complicated situations outside of medicine also lend themselves well to checklists. The field of venture capital finance offers another great example. In researching his book, Gawande spoke with Mohnish Pabrai, the managing partner of Pabrai Investment Funds in California. Pabrai runs a $500 million portfolio, and he considers himself a “value investor” – i.e. someone who looks for discounts by buying shares in under recognized, undervalued companies. He does intensive research, and invests for the long run. His aim is to buy Coca-Cola before everyone realizes it’s going to be Coca-Cola.

Every year, Pabrai hits upon hundreds of potential investment possibilities, but most drop away after cursory examination. Every so often though, he spots one that starts his pulse racing. In the heat of the moment, it seems like a sure-fire bet. Pabrai can’t believe no one else has caught onto it yet. He begins to think it could make him tens of millions of dollars if he plays it right, no, this time maybe hundreds of millions.

“You go into greed mode,” Pabrai told Gawande. This is why serious, and successful investors like Pabrai rely so heavily on checklists. Checklists help them focus on dispassionate analysis, avoiding both irrational exuberance and panic. They assess the company’s financial reports, investigate its liabilities and risks, examine its management team’s track record, weigh its competitors, and consider the future of the market. These are complicated factors, to be sure. But they lend themselves very well to a checklist.

Finally, there are complex problems, which tend to be highly unique and individualized. For instance, says Gawande, once you learn how to make venture capital investments, or to send a rocket to the moon, you can repeat the process with other start-up companies, or other kinds of rockets and perfect it. One rocket is like another rocket.

But this is not so with raising a child, to use a different example. Every child is unique. Although raising one child may provide experience, it does not guarantee success with the next child. Repeating the same child-rearing steps with a second child could produce precisely the opposite results. Expertise is valuable, but certainly not sufficient.

This is why highly complex situations call for a very different kind of checklist.
Checklists for Complex Environments

To show how checklists can be successfully applied to highly complex, and even chaotic situations, Gawande tells the story of how Wal-Mart played an important role in helping the good people of New Orleans in the midst of the 2005 Hurricane Katrina disaster.

It’s been well documented that the federal and state governments were ineffective during the hours and days immediately following Katrina. The trouble, according to Gawande, wasn’t a lack of sympathy among top officials. Of course the U.S. government wanted to help its citizens in a time of desperate need. It also wasn’t a problem of resources. The government certainly had the means, financially and militarily, to deliver support. In Gawande’s view, the main problem was a fundamental lack of understanding that, in the face of extraordinarily complex problem, power needed to be pushed out of the center as far as possible. As the author puts it, “Everyone in New Orleans was waiting for the cavalry to come, but a centrally run, government-controlled solution was not the answer.”

Asked afterward to explain the disastrous failures of FEMA and other government bodies, Michael Chertoff, then secretary of Homeland Security, said that it had been an “ultra-catastrophe,” a “perfect storm exceeded the foresight of the planners, and maybe anybody’s foresight.” But that’s not a real explanation, writes Gawande. It’s simply the textbook definition of a complex situation. And dealing with such a situation requires a different kind of solution from the command-and-control paradigm officials relied on.

Where FEMA and others were failing, of all organizations, it was oddly enough Wal-Mart that best recognized the complex nature of the circumstances. Briefed on what was developing, the giant discount retailer’s chief executive officer, Lee Scott, issued a simple edict. “This company will respond to the level of this disaster,” he was remembered to have said in a meeting with his upper management. “A lot of you are going to have to make decisions above your level. Make the best decision that you can with the information that’s available to you at the time, and, above all, do the right thing.”

As one of the Wal-Mart employees in that meeting later recalled, “That was it.” Lee Scott’s edict was passed down to store managers, and it set the tone for how people were expected to react. On the front-lines, Wal-Mart had 126 stores closed due to damage and power outages. Twenty thousand employees and their family members were displaced. The initial focus was on helping them. And amazingly, within forty-eight hours, more than half of the damaged stores were out and running again. But according to one executive on the scene, as word of the disaster’s impact on the city’s population began filtering in from Wal-Mart employees on the ground, the priority shifted from reopening stores to “Oh, my God, what can we do to help these people?”

Acting on their own authority, Wal-Mart’s store managers began distributing diapers, water, baby formula, and ice to residents. According to Gawande, where FEMA still hadn’t figured out how to requisition supplies, the managers fashioned crude paper-slip credit systems for first responders, providing them with food, sleeping bags, toiletries, and also, where
available, rescue equipment like hatches, ropes and boots. In one incredible story, the assistant manager of a New Orleans-area Wal-Mart store that had been engulfed by a thirty-foot storm surge found a bulldozer and ran it through her store, loading it up with any items she could salvage. And then gave them all away in the parking lot. Later, when the area hospital was running short of drugs, she went back in and broke into the store’s pharmacy, and was lauded by upper management for it.

How was it that Wal-Mart was able to supply medicine, food and supplies to refugees (and even to the National Guard) a day before FEMA finally appeared on the scene? Well, it was largely because of some very smart-thinking by a handful of key Wal-Mart employees. But also, in no small measure, it was because of checklists.

As Gawande explains, highly complex situations defy scripting by their very nature. It’s not as though Wal-Mart had considered in advance that New Orleans might one day find itself largely underwater, and created a checklist for how employees should respond in that case.

Instead, what they did do is create a series of checklists on how employees, and management, should respond in the case of disasters more generally. Basically, these checklists accomplished two things: (1) they empowered store managers, assistant managers and front-line employees to make certain kinds of decisions that would normally be made by head-office back in Arkansas; and (2) they established clear rules and protocols as to how employees should communicate with each other during a disaster situation.

This was important because while it is not possible to script the exact steps to be followed during a complex, ever-changing disaster scenario, it is possible, and desirable, to require people to talk to one another and share information in a disciplined way. In a chaotic environment, you can’t employ a top-down approach, but you also can’t have everyone acting on their own. Checklists can bring people together.

Checking for Brown M&M’s

As we’ve seen, whether a workplace situation is simple, complicated, or highly complex, checklists can be used successfully. But this doesn’t mean there should be a long, cumbersome checklist for each and every situation. In fact, according to Gawande, the shorter a checklist is, the better it is. Even if it’s only one or two items, that’s perfectly fine.

To illustrate the power of a well-designed one item checklist, Gawande reminds us of David Lee Roth’s infamous insistence that Van Halen’s contracts with concert promoters during the 1980’s contain a clause specifying that a bowl of M&M’s has to be provided backstage, but with every single brown candy removed, upon pain of forfeiture of the show. On at least one occasion, Van Halen followed through on this, pre-emptively cancelling a show in Colorado when Roth found some brown M&M’s in his dressing room. As Gawande explains, this incident turned out to be not another example of the insane demands of a power-mad celebrity, but rather an ingenious little checklist.
As Roth explained in his memoir, Crazy from the Heat, “Van Halen was the first band to take huge productions into tertiary, third-level markets. We’d pull up with nine eighteen-wheeler trucks, full of gear, where the standard was three trucks, man! And there were many, many technical errors - whether it was the girders couldn’t support the weight, or the flooring would sink in, or the doors weren’t big enough to move the gear through. The contract rider read more like a version of the Chinese Yellow Pages because there was so much equipment, and so many human beings to make it function.”

In the face of all of this complexity, as an important litmus test, buried somewhere in the middle of the rider, would be article 126, also known as Roth’s no-brown-M&M’s clause.

When Roth and his band-mates would walk backstage, if they saw a single brown M&M in that bowl, they would deep-six the entire production. In Colorado, this turned out to be a wise decision on Van Halen’s part. After Van Halen pulled the plug on the show over a few brown M&M’s, the band’s engineering experts found the local promoters had failed to read the weight requirements and the stage would have fallen through the arena floor.

Thus, a well-crafted one-point checklist helped avoid an almost-certain catastrophe.

Creating Your Own Checklist

As we’ve just seen, a good checklist does not have to be long to be effective. So what else goes into a good checklist? Well, for starters says Gawande, good checklists are always precise. They leave zero room for interpretation (e.g. no brown M&M’s literally means NO BROWN M&M’s!). Also, a good checklist is efficient. It does not attempt to spell out every single step – i.e. a checklist cannot fly a plane. Instead, it provides a reminder of only the most critical and important steps; the ones that even the highly skilled professionals using them could miss. Good checklists are, above all, practical.

Importantly, the look of the checklist matters. The font should not be too small, and ideally, it should fit on one page. It should be free of clutter and unnecessary colors.

Once your checklist is written, it’s important to be disciplined and stick with it. Gawande admits that checklists can be painstaking. They’re not much fun. But then again, that’s really the point. Being disciplined enough to consistently use a checklist or three at work may not seem quite as wild and daring as making things up on the fly. But if you believe Gawande, checklists are absolutely essential nowadays for handling situations of high stakes and great complexity. The alternative, he says, is failure. And who wants that?

Conclusion

No matter how smart, talented or experienced you are, chances are you still drop the ball at work sometimes. And you’re not alone, because your bosses, colleagues, suppliers and employees make mistakes too. The fact is, we are all plagued by missed subtleties, overlooked knowledge, and out-right errors. No one is immune to screwing-up.
When we stop to think about our past failures, we commonly imagine that little can be done to prevent future screw-ups beyond working harder and acquiring more knowledge. Most of us are not in the habit, says Atul Gawande, of thinking the same way commercial airplane pilots do as they ready their plane to take flight.

They too could decide to “try harder” not to crash their plane, and/or dismiss previous crashes as the result of inexperience by the pilot. Instead, all successful pilots choose to accept their natural human fallibilities. They recognize the simplicity and power of using a checklist.

Most of us are not airline pilots, but we do have to fly our own desks. Soaring without a net in today’s corporate world, we need all the help we can get to survive the turbulence and avoid catastrophic crashes. If more training, and longer hours at work is not the answer, then maybe it’s time to try something else. Maybe it’s time to try a checklist.