

INNOVATION

# Why Constraints Are Good for Innovation

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[Recent surveys](#) show that managers tend to consider compliance restrictions and a lack of resources as the main obstacles to innovation. [This common wisdom](#) suggests eradicating all constraints: by getting rid of rules and boundaries, creativity, and innovative thinking will thrive. Our [research](#), however, challenges this wisdom and suggests that managers can innovate better by embracing constraints. We reviewed 145 empirical studies on the effects of constraints on creativity and innovation, and found that individuals, teams, and organizations alike benefit from a healthy dose of constraints. It is only when the constraints become too high that they stifle creativity and innovation.

As a simple illustration of the principle, consider GE Healthcare's MAC 400 Electrocardiograph (ECG), which [revolutionized](#) rural access to medical care. The product was the outcome of a formidable set of constraints imposed on GE engineers: develop an [ECG device](#) that boasts the latest technology, costs no more than \$1 per scan, is ultra portable to reach rural communities (i.e, should be lightweight and fit into a backpack), and is battery operated. The engineers [were given](#) just 18 months and a budget of \$500,000 – a very modest budget by GE's standards, given that development of its predecessor cost \$5.4 million. Our research suggests that GE engineers were not successful despite these constraints, but *because* of them. Constraints can foster innovation when they represent a motivating challenge and focus efforts on a more narrowly defined way forward.

According to the studies we reviewed, when there are no constraints on the creative process, complacency sets in, and people follow what psychologists call the path-of-least-resistance – they go for the most intuitive idea that comes to mind rather than investing in the development of better ideas. Constraints, in contrast, provide focus and a creative challenge that motivates people to search for and connect information from different sources to generate novel ideas for new products, services, or business processes.

Therefore, managers can embrace and use a variety of constraints in their arsenal. These constraints take three main forms. First, they can limit inputs (e.g., time, human capital, funds, excess cash, and available materials). For example, managers may intentionally cap resources in corporate entrepreneurship initiatives to motivate employees to be more resourceful. Second, they can enforce specific processes. Examples include procedures on seeking early market and technological feedback (e.g., [lean start-up model](#)), guidelines on how small cross-functional work teams should interact (e.g., [agile management approaches](#)), or rules for brainstorming. Third, they can set specific output requirements such as product or service specifications. For example, Apple's former Design Chief [Jonathan Ive](#) is known to have imposed use of scratch-resistant aluminosilicate glass during the design of iPhone 4.

But managers also need to be mindful about imposing too many constraints. When a creative task is too constraining, [employees' motivation is hampered](#). If the space within which creative ideas are generated becomes too narrow, it is harder to form novel connections and serendipitous insights – both of which are vital for creativity. Hence, the key for fostering creativity and innovation in your organization is to strike a balance by orchestrating different types of constraints.

Google illustrates this balance by, on the one hand, providing employees ample freedom to work on innovation projects that they want to pursue (e.g., [Google 20% time](#)), and on the other hand, by embracing '[creativity loves constraints](#)' as one of their main principles to guide their innovation efforts. [Examples](#) of constraints used by Google include strict deadlines for developing prototypes and ambitious performance requirements about products in terms of its usability across different devices (e.g., it should work on all devices regardless of screen resolution) and download size or time.

Similarly, consider InnoCentive—one of the largest global crowdsourcing platforms—which orchestrates constraints to tackle complex R&D problems. [As former CEO Dwayne Spradlin noted](#), a typical innovation problem should contain tight output constraints (in the form of solution requirements), and typically these are combined with moderate input constraints (e.g., often time limitations ranging from a month to several months) but complete freedom in terms of the process through which the crowd comes up with the solutions.

When designing an effective balance of constraints, we recommend that managers take characteristics of the innovation project into account. As a general rule, the more an innovation requires breakthrough thinking (i.e., the more it seeks innovations that break away from the current state of affairs), the more it will benefit from relaxing input and output constraints, because such projects require atypical connections between disciplines, areas, and knowledge. Another rule is that interdisciplinary projects often benefit from clearly defined process constraints to govern communication and coordination. For innovation projects requiring both breakthrough thinking and cross disciplinary collaboration, managers can balance and orchestrate constraints by loosening input and output constraints while tightening the process constraints. In contrast, when the focus is on producing a more modest innovation that squarely builds on the current state of affairs (e.g., a new version of an existing car model), the project will be better off when the boundaries of what will and will not be acceptable ways forward are well-defined, together with relatively more ambitious time and budget constraints.

We recognize that not all constraints are under managerial control. Some constraints are simply a given, such as those imposed by government regulations or by nonnegotiable budget caps or deadlines. And even when managers can control constraints, it is not a given that employees will respond positively. Here, it is important to realize that the same constraint may be interpreted in different ways: as a motivating challenge or as a frustrating roadblock. This is where managers may mobilize their leadership abilities and influence how employees interpret constraints through communication and feedback. By framing constraints as creative challenges, managers can build an understanding of constraints as positives, and thus invite more creativity.

Such framing of constraints is particularly important because not all employees naturally embrace constraints. Some innovators are naturally drawn toward tackling complex problems and are inherently more accepting of and energized by tensions than others. While those employees are more inclined to be motivated by higher levels of constraints, others need to be convinced that constraints help by providing focus and direction.

One way to do this is by setting “flexible constraints”: some non-essential constraints may be included as a ‘nice-to-have’ (e.g., a design or performance constraints for a product) rather than a ‘must-have.’ Such flexible limitations provide a challenge for those who are up to it while also still engaging those who might shy away from the increased difficulty.

Managers should also create a strong **innovation climate** – one that is characterized by support for innovation, shared vision and objectives, shared commitment to excel, and sense of security. Such a climate is not only instrumental for innovation in and of itself but also for enabling people to navigate creatively under stricter constraints. Employees are more likely to embrace limitations in their creative pursuits in environments with open communication, collaboration, and supportive leadership and supervision.

The next time you struggle with innovation, take a look at your constraints structure. Instead of blaming them, frame them as creative challenges. Tell your employees that constraints help by ensuring focus and direction, and ask them to take up the challenge. Rather than providing ample resources and freedom to your innovation teams, try doing the opposite: cutting your budget, imposing a tighter deadline, or setting more challenging performance criteria.

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