

# **Author's Commentary on "New Technology - Who Is the Designer?"**

Commentary On  
New Technology - Who Is the Designer?

[Support for Fabio's Perspective](#)

[Support for Edgar's Position](#)

[Legal and Ethical Considerations](#)

[Initial Discussion](#)

[Additional Discussion](#)

[Ethical Milestones and Judgment](#)

Technology has become more than ever a collaborative product at all levels. With so much emphasis in academic research on the concept of intellectual property, this case illustrates a commonly blurred area between the right to ownership of one's ideas and the "right to exclude others from making, using, or selling" an invention. The primary ethical dilemma concerns the patenting of the sampling device; a secondary issue concerns authorship requirements. People in different positions view patents and authorship differently; that is where much of the conflict originates. From a contemporary academic perspective, Edgar is clearly the person with the good idea that was developed into a new technology, and he may deserve credit. In fact, it may appear difficult to make the case for Fabio's position. However, the concept of intellectual property in the business world often relies on the axiom that "possession is nine-tenths of the law." Furthermore, the patent is more a mechanism to protect initial market position for an invention than a means for providing credit or recognition.

It may be worth noting that technology can be a rather nebulous term, involving an overall approach rather than just an instrument or device. The patent discussed in this case applies to the sampling system built by Fabio (which is only part of Edgar's

idea), rather than to the overall sampling approach. In some cases, such as chemical manufacturing, a production process can be patented, but the intent in this case is not to characterize Edgar's concept for sampling as this kind of production process.

Patents require that competitors obtain direct permission from the patent holder if they wish to manufacture or market a product, invention or process covered by the patent. A patent prevents someone from "reverse engineering" Fabio's design with the intention of marketing it independently. According to law, only the inventor may apply for a patent (except in particular situations, such as when the inventor is dead). More than one person can be an inventor, but a person providing financial support to the development is not considered a joint inventor. Application for a patent requires: 1) a written document that comprises a specification and an oath that the inventor believes him/herself to be the original inventor; 2) a drawing (when necessary); and 3) the filing fees. (U. S. Department of Commerce, 1992)

However, the concept of intellectual property introduces some important questions. In science, intellectual property is primarily an issue of credit and recognition rather than the marketing or production issues addressed by a patent. The research community acknowledges the potential conflict between openness and competition for discovery. Research institutions, academic journals and federal funding sources (such as the National Science Foundation) have set standards protecting individuals with good ideas by ensuring that they receive credit for their contributions. (National Academy of Science, National Academy of Engineering, Institutes of Medicine, 1993)

[Back to Top](#)

## **Support for Fabio's Perspective**

We begin by making the case for Fabio to support an extended discussion with those more familiar with the intellectual property arguments. In this case, Fabio prepared all technical drawings and defined explicit specifications for the sampling machine. While these documents were inspired by a rough sketch and statement of needs that Edgar had defined, the initial concept was hardly a design. Analogously, many people had the idea of human flight long before the first successful design. Edgar's concept of an improved sampler may not have contained the detail required

for patent until Fabio invented the specific design to solve Edgar's problem. Furthermore, Edgar entered into a financial contract with Fabio that compensated Fabio for his design. While Edgar did review the designs occasionally, there is no evidence in the case (as written) supporting Edgar as a collaborative inventor. To Fabio, Edgar's contribution could have been design review milestones in developing a customized vendor product. In fact, Fabio based much of his design on a hand-operated sampling machine that he clearly invented without Edgar. These arguments are all consistent with patent guidance supporting Fabio as the inventor.

[Back to Top](#)

## **Support for Edgar's Position**

It appears clear that Edgar saw the application of this new technology as his idea, his intellectual property. After all, he recognized the need to improve current sampling methods and took all the necessary steps to implement his idea. He sketched out a concept that became the basis for the design or at least inspired it. Edgar approached Doris to secure half the development funds and hired Fabio to fabricate - not invent - the design concept. Edgar provided more than the initial design concept; he suggested to Fabio other technologies to be integrated into a system design. Fabio accepted these additional ideas as part of the collaborative effort that included joint review and development of the drawings and specifications. Simply put, without Edgar this design would not have existed in its current form. And Edgar is not claiming to be the sole inventor, he just wants to be named on the patent.

[Back to Top](#)

## **Legal and Ethical Considerations**

From a legal point of view, Fabio may have more evidence that he designed the system. He holds all detailed specifications and drawings. Edgar never used his professional engineering license to stamp or approve the design. (In fact, Edgar may have been outside his practice area if he had because the device is a mechanical system, not a civil engineering design.) The case can be made that Edgar's contributions to the project were financial rather than design. Edgar can

certainly contest these arguments, but he has less evidence in hand. By putting his design ideas into loose files instead of his project notebook, he may have weakened his position. However, Edgar does hold some legal ground. That loose file can be offered as evidence despite the legal preference for bound research notes. He can show the contract with Fabio as defining the design concepts and argue that he is a co-inventor. Edgar can claim that the design reviews with Fabio were not simply contractual milestones between vendor and client, but important collaborative discussions on the system design. He has Doris (at least), whose early approval he sought to pursue this idea further, although in her press releases she identified the design as Fabio's. These legal claims have never been made in this case.

Ethically, the characters in this case did not identify any problem until the patent issue arose. Edgar seemed more interested in the intellectual insights that improved sampling would provide, and he was proud to publish articles discussing the sampling protocol he pioneered (which used the technology built by Fabio). He was not particularly interested in the legal benefits of a patent, namely the right to license the design to competing vendors or exclude them from using the design. As a leading vendor in the field, Fabio has a clear interest in improving his product line and competitive position in the market. He benefited from the articles published by Edgar, even without being an author, because Fabio could cite current research claims as testimonials that his design was high quality and cost effective. If Fabio had not applied for a patent, would this case raise any ethical issues at all?

[Back to Top](#)

## Initial Discussion

The initial questions for discussion try to clarify some of these issues. Many researchers do not consider vendors or technicians to be colleagues involved in innovations; they are rarely included as authors. Discussing Edgar's role in meeting with Fabio to review the drawings and specifications may identify underlying bias in the participants. (This case was specifically designed so that Fabio was an outside vendor, perhaps not covered by the intellectual property policies of Edgar's research institution.)

Whether or not Edgar should have included Fabio as an author may be discussed within the context of the Academies' standards and/or by using some journals'

actual authorship guidelines. The primary issue is whether each named author made a significant intellectual contribution to the paper. Depending on the focus of Edgar's papers, Fabio could have made a significant contribution to the design of the sampling protocol by building the sampling machine. Alternatively, Edgar could have focused on field development and testing in such a way that Fabio's contribution was less significant. Consensus on this point may be more difficult than it appears.

Some guidelines for authorship may include:

1. Conception and design of the experiment;
2. Execution of the experiment and collection and storage of the supporting data;
3. Analysis and interpretation of the primary data; and
4. Preparation and revision of the manuscript. (National Academy of Science, National Academy of Engineering, Institutes of Medicine, 1993, p. 52)

The question of including Edgar on the patent may be ethically clearer, if not legally so. Fabio may have a business concern about including Edgar on the patent, because as a patent holder Edgar could participate in licensing the technology to Fabio's competitors. *General Information Concerning Patents* states, "Any joint owner of a patent, no matter how small the part interest, may make, use, and sell the invention for his or her own profit, without regard to the other owner." (U. S. Department of Commerce, 1992, p. 27) This right includes selling one's interest or granting licenses to others without consulting the other joint owner, unless the joint owners of the patent agree to other conditions independent of the patent. Edgar's desire for recognition as an inventor could be legitimate ethically. With some better negotiation, Edgar and Fabio may have found conditions that met both of their objectives. For example, Fabio could retain all licensing rights and a majority ownership of the patent. Edgar could be named on the patent, but his share of royalties or licensing fees could be limited. This kind of agreement is common within corporations.

Mac may also have some claim to the patent if his contribution in field development resulted in significant design elements in the patent; his contribution is unclear, however. It appears that Doris has no claim as an inventor since she provided only financial support. By publicizing the technology in company literature, she may have added to the motivations for Fabio to seek patent protection. Doris's role, as presented in the commentary and to some extent in the case, does not clearly

indicate sufficient contribution to warrant co-authorship. Perhaps she was invited to be a co-author by Edgar as a courtesy for her support. This question could be briefly discussed as another ethical issue related to this study.

[Back to Top](#)

## **Additional Discussion**

The additional information included in the case attempts to further clarify the legal and ethical analysis. By weakening Edgar's legal case somewhat, the discussion necessarily focuses on the ethical dimensions. Some participants may follow the weakening legal position and conclude that Fabio is the sole designer of the technology; others who are more secure in the academic concept of intellectual property may continue to defend Edgar's position. One can introduce additional scenarios where Edgar might have included some intellectual property agreement into his initial contract with Fabio. If this happens, it may be valuable to adopt Fabio's perspective again and challenge the fairness of this agreement regarding patent ownership.

The question about Fabio's education relative to Edgar's is designed to expose for discussion any underlying preference in academic research for the intellectual authority. This concern is also relevant in corporate research. There are many cases where ideas that were developed by the technicians or junior engineers/researchers were adopted by their supervisors without credit. Despite the potential for these abuses, this may be more of a confounding question than necessary, and could be quickly put aside in discussion if no debate occurs.

When we change the contractual relationship between Edgar and Fabio from client/vendor to fellow employees - and, moreover, to supervisor and subordinate - the assessment may change. First, it becomes constrained by any applicable prior agreements within the institution. (This point could provide a good opportunity to review the research facility's policies on ownership of ideas.) Second, the responsibility for work products such as a new design may be less clearly defined. Edgar is the principal investigator and may be considered in responsible charge of all the products of this research. His authority may improve his claim to the design and patent, although it should not displace Fabio from the patent.

# Ethical Milestones and Judgment

We can identify many places where Edgar could have acted to clarify his claim to the intellectual property and as co-inventor. Some suggested opportunities include:

1. Conception: Edgar could have used his field notebook, or another personal notebook, to document his design concept better.
2. Initial contract with Fabio: Edgar could have discussed the implications of the idea with Fabio initially, perhaps documenting some agreement about final disposition of the technology. At a minimum, they might have agreed to explicitly discuss the topic during design review intervals.
3. Publishing results: Edgar could have included Fabio as a coauthor, using these opportunities to share credit with Fabio. These were opportunities to begin (or reopen) discussion about the potential patent. In this regard, Edgar seems to have ignored the value of a patent until Fabio's patent application.
4. Following patent application: Edgar could have retained a patent attorney to review the evidence. The case may be strong enough to contest, or at least strong enough to reopen discussion with Fabio about joint ownership. There are mechanisms to add a name to a patent after filing when another inventor should be included. This could be the least effective strategy for Edgar and it may be the most costly.

In assessing the ultimate fairness of the outcome, two perspectives may be useful. One takes the initial motivations of each of the characters into account. From this perspective, it can be argued that all achieved their initial objectives. Sampling at Doris's site benefited from improved sampling protocols and from positive public relations. Mac received good field experience and co-authorship in journal publications. Edgar achieved all of the objectives he had for the research, published well-respected articles and received promotion. Edgar's intellectual property claims to the research results were never contested. Fabio expanded his product line to include a new system for sampling, improving his reputation as a vendor, and protected his product design from competition by patenting the technology.

The other perspective is whether the design idea was collaborative. If so, then it may be most ethical for Fabio to include Edgar on the patent. However, Fabio has

an interest in negotiating with Edgar limited authority to sell or license the technology to Fabio's competitors. Edgar might have some ethical obligation to share authorship with Fabio as well. This perspective would require more negotiation between the two characters to achieve a satisfactory result. The meanings we attach to the terms concurrent engineering, team development, etc., have important implications for both intellectual property and patent protection.

Certainly, the opportunities to resolve the concerns raised here were most available early on. With the increased complexity of technology and interdisciplinary teams in research, this point becomes the central lesson to draw from the case.

[Back to Top](#)

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