

USPTO Has Opportunities to Improve its Patent Examination Process and to Advance Patent Decision-Making

FINAL REPORT NO. OIG-22-010-I

DECEMBER 2, 2021



U.S. Department of Commerce
Office of Inspector General
Office of Audit and Evaluation



December 2, 2021

MEMORANDUM FOR: Andrew Hirshfeld
Performing the functions and duties of the Under Secretary of
Commerce for Intellectual Property and Director of the
United States Patent and Trademark Office

A handwritten signature in black ink, appearing to read "F. Meny, Jr.", with a stylized flourish at the end.

FROM: Frederick J. Meny, Jr.
Assistant Inspector General for Audit and Evaluation

SUBJECT: *USPTO Has Opportunities to Improve its Patent Examination Process
and to Advance Patent Decision-Making*
Final Report No. OIG-22-010-I

Attached for your review is the final report on the evaluation of the United States Patent and Trademark Office's (USPTO's) patent examination process. The objectives were to (1) assess whether patents are examined in compliance with applicable statutes, regulations, and case law; (2) identify deficiencies within the examination process impacting the quality of patents granted; and (3) identify areas for improvement within the examination process to increase its effectiveness and efficiency.

We contracted with The MITRE Corporation (MITRE)—an independent firm—to perform this evaluation. Our office oversaw the progress of this evaluation to ensure that MITRE performed the evaluation in accordance with the Council of the Inspectors General on Integrity and Efficiency's *Quality Standards for Inspection and Evaluation* (December 2020) and contract terms. However, MITRE is solely responsible for the attached report and conclusions expressed in it.

In its evaluation of the patent examination process, MITRE identified the following:

1. USPTO examines patents in compliance with applicable statutes, regulations, and case law.
2. USPTO quality review practices may not provide an accurate measure of patent examination quality.
3. USPTO does not meet all the timeliness benchmarks detailed in statute, impacting stakeholders' right to prompt notice of the patent landscape.
4. USPTO does not have a reliable means of measuring or controlling examiner consistency.
5. USPTO has internal controls for most aspects of the U.S. Government Accountability Office (GAO) *Green Book*, but they are not managed as a system of controls.

6. Examiners have adequate patent and non-patent prior art search resources, but improvements could have a significant positive impact on effectiveness and efficiency.

MITRE recommended that the Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office take the following actions:

1. Direct the Commissioner for Patents to (1) measure the effectiveness of the Office of Patent Quality Assurance (OPQA) process and its targets, and (2) take appropriate action to remedy any shortcomings.
2. Direct the Commissioner for Patents to publicly release more of the OPQA review methodology and data to solicit external feedback on the review process.
3. Direct the Commissioner for Patents to solicit external stakeholder feedback on responsiveness as an additional performance indicator and to calibrate incentives and expectations.
4. Direct the Commissioner for Patents to assess the effectiveness of current tools (e.g., those aiding in performing prior art search and preparation of Office Actions) to help examiners perform more efficiently.
5. Direct the Commissioner for Patents to establish regular monitoring of consistency in examination decisions, including trainees' decisions, by randomly selecting applications for parallel examination.
6. Direct the Commissioner for Patents to establish and empower a quality control oversight body to create a comprehensive internal control system consistent with the guidance in the *GAO Green Book*.
7. Direct the Office of Patent Automation to define objective measures of effectiveness for the search tools and training to inform decisions related to prior art search improvements.

On October 18, 2021, we received USPTO's response to MITRE's draft report. In response to MITRE's draft report, USPTO concurred with recommendations 1–3 and 5–7 and partially agreed to recommendation 4. For recommendation 4, USPTO suggested we redirect the recommendation from the Office of the Chief Information Officer to the Commissioner for Patents. MITRE reviewed the recommendation and revised the report accordingly. USPTO's formal response is included within the final report as appendix G.

Pursuant to Department Administrative Order 213-5, please submit to us an action plan that addresses the recommendations in this report within 60 calendar days. This final report will be posted on the Office of Inspector General's website pursuant to sections 4 and 8M of the Inspector General Act of 1978, as amended (5 U.S.C. App., §§ 4 & 8M).

We appreciate the cooperation and courtesies extended to MITRE by your staff during this evaluation. If you have any questions or concerns about this report, please contact me at (202) 482-1931 or Amni Samson, Director for Audit and Evaluation, at (571) 272-5561.

Attachment

cc: David L. Berdan, Performing the functions and duties of the Deputy Under Secretary of Commerce for Intellectual Property and Deputy Director, USPTO
Andrew I. Faile, Acting Commissioner for Patents, USPTO
Jay Hoffman, Chief Financial Officer, USPTO
Sean Mildrew, Deputy Chief Financial Officer and Audit Resolution Officer, USPTO
Jamie Holcombe, Chief Information Officer, USPTO
David Shewchuk, Acting General Counsel, USPTO
Stacy Long, Senior Counsel for Employment Litigation and OIG Matters, USPTO
Nicolas Oettinger, Senior Counsel for Regulatory and Legislative Affairs, USPTO
Welton Lloyd, Jr., Audit Liaison, USPTO
Mohamed Ahmed, Assistant Audit Liaison, USPTO
MaryAnn Mausser, Audit Liaison, Office of the Secretary



MP210984
MITRE PRODUCT

USPTO Patent Examination Process Evaluation Report

USPTO Has Opportunities to Improve its Patent Examination Process and to Advance Patent Decision-Making

The views, opinions and/or findings contained in this report are those of The MITRE Corporation and should not be construed as an official government position, policy, or decision, unless designated by other documentation.

Professor Ouellette's contribution to this publication was as a paid consultant and was not part of her Stanford University duties or responsibilities.

Professor John "Jay" Thomas' contribution to this publication as a paid consultant and was not part of his Georgetown University duties or responsibilities.

©2021 The MITRE Corporation.
All rights reserved.

McLean, VA

**Approved for Public Release,
Distribution Unlimited. Public
Release Case Number 21-3574**

Authors:

Kevin Gunn, MITRE

Lisa Ouellette, Stanford University Law

Jay Thomas, Georgetown University Law

Laura Genova, MITRE

Zoe Black, MITRE

**FINAL
December 2021**

This page intentionally left blank.

Executive Summary

Patents are designed to provide significant value to the U.S. economy by protecting intellectual property (IP) while fostering innovation. All patent applicants are entitled to a fair examination. Patent examiners at the U.S. Patent and Trademark Office (USPTO) examine patent applications to evaluate their conformance with statute and, ultimately, whether each application should be allowed or rejected. The U.S. Department of Commerce (“the Department”), Office of Inspector General (OIG) engaged The MITRE Corporation to evaluate the effectiveness and efficiency of the patent examination process.

Why We Did This Review

U.S. patent-intensive industries contributed over \$881 billion in value added to the gross domestic product in 2014¹ and accounted for approximately 33 percent of U.S. employment over the past two decades. Given the economic value of patent rights, USPTO should maintain an effective patent examination process to ensure examiners can make quality decisions that align with governing law. OIG tasked MITRE with the following three objectives: (1) assess whether patents are examined in compliance with applicable statutes, regulations, and case law; (2) identify deficiencies within the examination process impacting the quality of patents granted; and (3) identify areas for improvement within the examination process to increase its effectiveness and efficiency.

What We Found

Based on the scope of our evaluation and the information available to us (see Appendix A), we found that USPTO examines patents in compliance with applicable statutes, regulations, and case law (Section 2.1). We also identified the following deficiencies and areas for improvement within the examination process:

- USPTO's quality review practices may not provide an accurate measure of patent examination quality (Section 2.2).
- USPTO does not meet all the timeliness benchmarks detailed in statute, impacting stakeholders' right to prompt notice of the patent landscape (Section 2.3).
- USPTO does not have a reliable means of measuring or controlling examiner consistency (Section 2.4).
- USPTO has internal controls for most aspects of the Government Accountability Office (GAO) *Green Book*, but they are not managed as a system of controls (Section 2.5).
- Examiners have adequate patent and non-patent prior art search resources, but improvements could have a significant positive impact on effectiveness and efficiency (Section 2.6).

¹ U.S. Department of Commerce, U.S. Patent and Trademark Office, “Intellectual Property and the U.S. Economy: 2016 Update,” by Justin Antonipillai and Michelle K. Lee, (2016), 22, <https://www.uspto.gov/sites/default/files/documents/IPandtheUSEconomySept2016.pdf>.

What We Recommend

To address the findings in this report, we recommend the Undersecretary of Commerce and Director of the U.S. Patent and Trademark Office:

- R1:** Direct the Commissioner for Patents to (1) measure the effectiveness of the Office of Patent Quality Assurance (OPQA) process and its targets, and (2) take appropriate action to remedy any shortcomings.
- R2:** Direct the Commissioner for Patents to publicly release more of the OPQA review methodology and data to solicit external feedback on the review process.
- R3:** Direct the Commissioner for Patents to solicit external stakeholder feedback on responsiveness as an additional performance indicator and to calibrate incentives and expectations.
- R4:** Direct the Commissioner for Patents to assess the effectiveness of current tools (e.g., those aiding in performing prior art search and preparation of Office Actions) to help examiners perform more efficiently.
- R5:** Direct the Commissioner for Patents to establish regular monitoring of consistency in examination decisions, including trainees' decisions, by randomly selecting applications for parallel examination.
- R6:** Direct the Commissioner for Patents to establish and empower a quality control oversight body to create a comprehensive internal control system consistent with the guidance in the GAO *Green Book*.
- R7:** Direct the Office of Patent Automation to define objective measures of effectiveness for the search tools and training to inform decisions related to prior art search improvements.

Table of Contents

Executive Summary.....	iii
Why We Did This Review	iii
What We Found	iii
What We Recommend.....	iv
1 Introduction.....	1-1
1.1 Background	1-1
1.2 Patent Examination Process Phases	1-2
2 Objectives, Findings, and Recommendations	2-4
2.1 USPTO examines patents in compliance with applicable statutes, regulations, and case law.....	2-4
2.2 USPTO's quality review practices may not provide an accurate measure of patent examination quality.....	2-4
2.3 USPTO does not meet all the timeliness benchmarks detailed in statute, impacting stakeholders' right to prompt notice of the patent landscape.....	2-7
2.4 USPTO does not have a reliable means of measuring or controlling examiner consistency.	2-10
2.5 USPTO has internal controls for most aspects of the Government Accountability Office (GAO) Green Book, but they are not managed as a system of controls.	2-12
2.6 Examiners have adequate patent and non-patent prior art search resources, but improvements could have a significant positive impact on effectiveness and efficiency.....	2-14
3 Conclusion	3-17
4 Summary of Recommendations	4-18
5 Summary of Agency Response.....	5-19
Appendix A Objectives, Scope, and Methodology.....	A-1
Appendix B Patent Examination Process Statute	B-1
Appendix C Government Accountability Office (GAO) Green Book	C-1
Appendix D Patent Examiner Survey Summary Results.....	D-1
Appendix E Alignment of MITRE and Blue Book Standards.....	E-1
Appendix F Acronyms	F-1
Appendix G Agency Response	G-1

List of Figures

Figure 1-1. High-Level Phases of the Patent Lifecycle	1-3
Figure 2-1. Examination Time by Common Patent Activities.....	2-9
Figure C-1. GAO Green Book Internal Control Framework.....	C-1
Figure D-1. Controls Perceived as Helpful to Compliance	D-5
Figure D-2. Control Perceived as Not a Hindrance to Compliance	D-6
Figure D-3. Control Perceived as a Hindrance to Compliance	D-6
Figure D-4. Perception of Controls’ Impact on §§ 102 and 103 Compliance	D-7
Figure D-5. Perception of Controls’ Impact on §§ 101, 112(a), and 112(b) Compliance.....	D-8
Figure D-6. Controls Perceived as Helpful to Meeting Personal Production Goals.....	D-9
Figure D-7. Control Perceived as Not a Hindrance to Meeting Personal Production Goals.....	D-10
Figure D-8. Expectations Perceived as Hindering Meeting Personal Production Goals.....	D-10
Figure D-9. Analysis of Potentially Conflicting Expectations.....	D-11

List of Tables

Table 2-1. USPTO Performance Against Internal “Correctness Indicator” Targets	2-5
Table 2-2. USPTO Pendency Performance for April 2021	2-9
Table A-1 Summary of Data Analysis Sources and Outputs.....	A-5
Table D-1. Patent Examiner Survey Population.....	D-2
Table D-2 Patent Examiner Survey Sample	D-3
Table D-3. Composition of the Respondents and Population by Technology Center	D-4
Table E-1. Alignment of MITRE and Blue Book Standards	E-1

1 Introduction

The U.S. Patent and Trademark Office (USPTO) is an agency within the Department of Commerce (“the Department”). In fiscal year (FY) 2020, the Department Office of Inspector General (OIG) identified “managing an increasing demand for intellectual property rights” as a top management challenge.² Key OIG-identified priorities related to USPTO included (a) ensuring a thorough, timely, and fair patent examination and review process; and (b) improving the management of information technology (IT) systems and operations.

1.1 Background

USPTO is responsible for administering the nation’s patent and trademark system as a means of promoting economic prosperity.³ Its mission is to “foster innovation, competitiveness and economic growth, domestically and abroad, by providing high quality and timely examination of patent and trademark applications.”⁴ USPTO does this by, among other things, guiding intellectual property (IP) policy, including those relevant to the examination and granting of patents.

The patent examination process at USPTO centers on determining an application’s conformance with statute and whether the invention meets the requirements for patentability as defined by Title 35 of the U.S. Code (35 U.S.C.). Patent examiners are responsible for issuing Office Actions (formal documentation of the examination outcome) to communicate the patent examiner’s decision: allowance,⁵ non-final rejection,⁶ or final rejection of the application. Office Actions are based on an examiner’s expert evaluation of an application against the patentability requirements, including four statutes.⁷

- **35 U.S.C. § 101 – Inventions Patentable:**⁸ A patentable invention must consist of a process, machine, manufacture, or composition matter;⁹ and it must be capable of a specific real-world use.
- **35 U.S.C. § 102 – Conditions for Patentability; Novelty:** The invention must be different from the state of the art at the time of filing (i.e., novel). The “state of the art” includes earlier patents and publications (i.e., “prior art”).

² U.S. Department of Commerce Office of Inspector General, “Top Management and Performance Challenges Facing the Department of Commerce” (2019), 2, <https://www.oig.doc.gov/OIGPublications/OIG-20-001.pdf>.

³ Although less than one percent of U.S. firms were granted a patent between 2000 and 2011, these firms accounted for 33 percent of U.S. employment. USPTO, “Intellectual Property and the U.S. Economy: 2016 Update,” by Justin Antonipillai and Michelle K. Lee, (2016), 22, <https://www.uspto.gov/sites/default/files/documents/IPandtheUSEconomySept2016.pdf>.

⁴ U.S. Department of Commerce, “U.S. Patent and Trademark Office” (web page). <https://www.commerce.gov/bureaus-and-offices/uspto> (website), accessed June 30, 2021.

⁵ “The applicant is entitled to a patent under the law,” i.e., the examiner finds the patent application conforms with the requirements for patentability. USPTO, MPEP § 1303, Notice of Allowance (web page), *Manual of Patent Examining Procedure* (website), accessed July 5, 2021, <https://www.uspto.gov/web/offices/pac/mpep/s1303.html>.
<https://www.uspto.gov/web/offices/pac/mpep/s1303.html>.

⁶ The patent application *does not conform* with the requirements for patentability.

⁷ Title 37 of the Code of Federal Regulations (37 C.F.R. Patents, Trademarks, and Copyrights) and the Manual of Patent Examining Procedure (MPEP) reflect USPTO’s implementation of 35 U.S.C., and both can change as a result of case law.

⁸ 35 U.S.C. § 101 is commonly referred to as the “patentable subject matter” requirement.

⁹ “...or any new and useful improvement thereof...” 35 U.S.C. § 101.

- **35 U.S.C. § 103 – Conditions for Patentability; Non-obvious Subject Matter:** The invention must not have been obvious to a person having ordinary skill in the art who is familiar with all the prior art at the time the application was filed.
- **35 U.S.C. § 112 – Specification:**¹⁰ The application must sufficiently describe the invention such that skilled artisans may practice the invention without undue experimentation.¹¹ This section also requires that the application include claims that define the invention sought to be patented.¹²

See Appendix B for details on each of the U.S.C. sections.

1.2 Patent Examination Process Phases

The patent examination process is comprised of three phases: pre-examination, examination, and post-examination (see Figure 1-1). Pre-examination activities comprise all administrative activities from initial filing through the completion of the administrative review and the mailing of a filing receipt. Post-examination activities include administrative steps to prepare all documentation for publication and the issuance of the patent.

The examination phase is the heart of the process and is the main focus of this evaluation. Once an application is assigned to an examiner, responsibility shifts to the examiner to manage the engagement with the applicant, as necessary, and issue a decision in the form of an Office Action to allow or reject the patent application.¹³ After each action, the applicant has a right to respond to decisions, including submission of an appeal after a final rejection. Responsiveness of all key stakeholders is critical to efficient and consistent patent examination. If the applicant does not respond to certain decisions in a statutorily prescribed amount of time, USPTO considers the application to be “abandoned.”

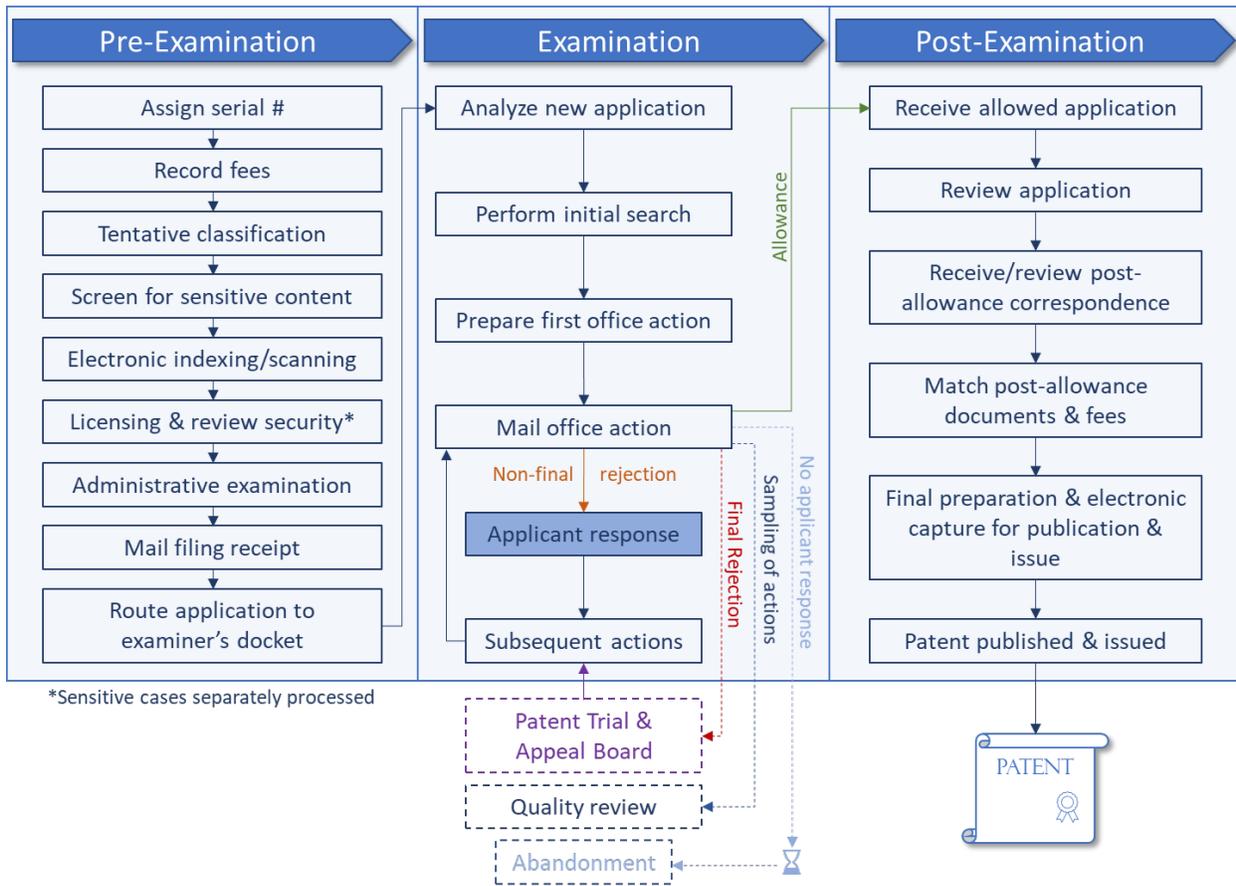
¹⁰ 35 U.S.C. § 112 incorporates the “enablement” and “claim definiteness” requirements.

¹¹ 35 U.S.C. § 112(a).

¹² 35 U.S.C. § 112(b).

¹³ The assessment of a patent application’s conformance with the statute is a matter of judgment on the part of the patent examiner. Patent examiners process multiple applications at a time, and their work is iterative.

Figure 1-1. High-Level Phases of the Patent Lifecycle



Source: MITRE redrawing of USPTO-provided diagram

2 Objectives, Findings, and Recommendations

The overall goal of this evaluation was to assess the effectiveness and efficiency of the USPTO patent examination process. The objectives were to (1) determine whether the patent examination process complies with statute, regulations, and case law; (2) provide USPTO with recommendations to correct any deficiencies identified during the evaluation; and (3) identify areas for improvements to USPTO procedures, operations, skills, or systems relating to the patent examination process. As part of this evaluation, we conducted a survey of a sample of the patent examiner corps. The sample was representative of the Technical Centers and levels of experience and responsibility of USPTO's patent examiners. *See Appendix A for details on this evaluation's scope and methodology.*

2.1 USPTO examines patents in compliance with applicable statutes, regulations, and case law.

Based on the scope of our evaluation and the information available to us (see Appendix A), we found that USPTO's patent examination process complies with the parts of governing statutes¹⁴ and related regulations¹⁵ pertaining to the process. Its guidance to examiners, the Manual of Patent Examining Procedure (MPEP), covers all relevant aspects of the statutes and regulations, and USPTO updates the guidance in response to pertinent court decisions. Examiner training is comprehensive and consistent with the MPEP guidance, and responsive to changes in that guidance. In our direct observations, data analyses, surveys, and interviews with USPTO staff, we found no evidence to suggest that examiners do not follow the MPEP guidance to the best of their abilities. We did, however, discover some deficiencies and areas for improvement in the process that do not affect its compliance. These are discussed in the following sub-sections.

2.2 USPTO's quality review practices may not provide an accurate measure of patent examination quality.

Patent quality is an ambiguous concept. Therefore, we focused this evaluation on the quality of the patent application *decision*: allowance or rejection. Our working definition of a high-quality patent decision is one that, if challenged, would be affirmed by the courts or the Patent Trial and Appeal Board (PTAB).¹⁶ The successful defense of patent application allowances and rejections hinges on the examiner's correct determination of the application's compliance with the requirements for patentability (see Section 1.2). Erroneous allowances and rejections may impose costs on patent applicants, technology implementers, and the public.

USPTO tries to limit the occurrence of incorrect allowances and incorrect rejections through comprehensive examiner training and primary and supervisory patent examiner (SPE) internal reviews. USPTO's primary measure for quality, however, are Office Action reviews performed by the Office of Patent and Quality Assurance (OPQA). OPQA reviews a random sample of examiners' allowance, non-final rejection, and final rejection Office Actions—approximately

¹⁴ 35 U.S.C.

¹⁵ 37 C.F.R.

¹⁶ The PTAB is an administrative body within USPTO that adjudicates patent issues in a court-like setting.

12,000 total reviews annually or 1.5 reviews per examiner per year.¹⁷ The OPQA review process determines if the examiner made the correct decision for a specific Office Action with respect to requirements for patentability.

According to USPTO’s *2020 Performance and Accountability Report*, based on OPQA review of Office Actions, examiners are meeting USPTO’s performance goal for patentable subject matter determinations,¹⁸ but *not* for novelty, non-obviousness, nor enablement and claim definiteness (see Table 2-1).¹⁹ However, since the review process faces several challenges, those measures may not accurately reflect their true quality performance.

Table 2-1. USPTO Performance Against Internal “Correctness Indicator” Targets

	Patentable Subject Matter (§ 101)	Novelty (§ 102)	Nonobviousness (§ 103)	Enablement & Claim Definiteness (§ 112)
Target	>97%	>95%	>93%	>93%
Actual	97.7%	94.2%	88.8%	90.5%

Source: 2020 Performance and Accountability Report, based on OPQA review of office actions.

Reviewing Time Limitations

A leading concern about patent quality is that examiners do not have enough time to locate the most relevant prior art.²⁰ However, examiners have more than twice the time as OPQA reviewers to conduct a prior art search — on average, examiners spend about 20 hours on a patent application, about 40 percent (8 hours) of which is spent on prior art searches (see Section 2.3, Figure 2-1). OPQA reviewers are allotted four hours per review. Therefore, if examiners mistakenly allow a patent application because they failed to locate prior art that would render the invention non-novel or obvious, OPQA may not identify the omission.

Setting and Calibrating Quality Performance Targets

OPQA compliance targets are not connected to any objective standard or outcome. OPQA set the targets in 2016 based on its analysis of past performance and they have changed little since they were set. The targets also lack congruence with the technical center (TC)-internal reviews and practitioner satisfaction.

Reviews of junior examiners’ Office Actions by primary and supervisory examiners at the TC-level are comprehensive and timely;²¹ however, they do not correlate with better compliance rates at OPQA. Practitioners report *satisfaction* with novelty, non-obviousness, and enablement and claim definiteness determinations, but OPQA finds examiners underperforming in these

¹⁷ Over 8,400 patent examiners comprise the examiner corps.

¹⁸ 35 U.S.C. § 101.

¹⁹ 35 U.S.C. §§ 102, 103, & 112, respectively.

²⁰ Michael D. Frakes and Melissa F. Wasserman, “Is the Time Allocated to Review Patent Applications Inducing Examiners to Grant Invalid Patents? Evidence from Microlevel Application Data,” *Review of Economics and Statistics* 99.3 (2017): 550.

²¹ All Office Actions issued by junior examiners, and a sampling of those by primary examiners are reviewed by primary or supervisory patent examiners. In 2020, over 550,000 Office Actions went through a TC quality review. We consider the reviews timely because they typically (in the case of junior examiner actions) occur before USPTO action is mailed, so any errors caught can be corrected before the USPTO action is signed and mailed.

areas. In addition, practitioners report dissatisfaction with patentable subject matter determinations,²² where OPQA finds examiners performing *well*.

Barriers to Process Improvement

USPTO does not objectively measure the effectiveness of OPQA reviews. An independent review of OPQA's process and results could identify deficiencies and recommend improvements.²³ OPQA could also improve its review process with a more collaborative and transparent relationship with examiners and external stakeholders.

The OPQA review process is not a collaborative one between examiners and reviewers. When an examiner disagrees with an OPQA finding, they can file a "rebuttal." However, rebuttals typically require advocacy at levels above the examiner, and rebuttals do not usually result in OPQA changing its original finding of an error. As a result, examiners tend to view their relationship with OPQA as somewhat adversarial. A substantial proportion of patent examiners (20 percent) view feedback from OPQA as a hindrance to issuing compliant Office Actions. In addition, only about half of examiners consider OPQA feedback to be helpful.

In its *2018-2022 Strategic Plan*, USPTO includes an initiative to "enhance [the] transparency and communication of quality metrics."²⁴ USPTO publicly reports summary quality measures in its annual Performance and Accountability Report (PAR).²⁵ However, OPQA's full methodology²⁶ and detailed findings are not made public. This lack of transparency on OPQA criteria and results limits its ability to get feedback from the public to improve the review process.

Recommendations

We recommend the Undersecretary of Commerce and Director of the U.S. Patent and Trademark Office:

- R1:** Direct the Commissioner for Patents to (1) measure the effectiveness of the OPQA process and its targets, and (2) take appropriate action to remedy any shortcomings.

²² Recent judicial precedent has led to legal uncertainty about which inventions constitute patentable subject matter. The U.S. Supreme Court's decisions in *Mayo v. Prometheus*, 566 U.S. 66 (2012), and *Alice v. CLS Bank*, 573 U.S. 208 (2014), created a significant change in this doctrine. For a recent example of confusion in how to apply these precedents, with five separate opinions from the twelve judges of the U.S. Court of Appeals for the Federal Circuit, see *American Axle v. Neapco Holdings*, 967 F.3d 1285 (Fed. Cir. 2020), *rehearing en banc denied*, 966 F.3d 1347 (Fed. Cir. 2020).

²³ For example, an empirical study of a similar quality review program at another administrative agency with case numbers comparable to those handled by OPQA analyzed the rate of success of appeals for cases that went through the agency's quality review program and cases that did not. USPTO has undertaken no similar attempt to evaluate OPQA's effectiveness. David Ames, Cassandra Handan-Nader, Daniel E. Ho & David Marcus, "Due Process and Mass Adjudication: Crisis and Reform," *Stanford Law Review*, vol. 72 (January 2020): 2.

²⁴ USPTO, *2018–2022 Strategic Plan* (2018), 6, https://www.uspto.gov/sites/default/files/documents/USPTO_2018-2022_Strategic_Plan.pdf.

²⁵ USPTO, *FY 2020 Performance and Accountability Report*, 67, <https://www.uspto.gov/sites/default/files/documents/USPTOFY20PAR.pdf>.

²⁶ OPQA's internal Master Review Form (MRF) contains about 180 items. However, the publicly available version (<https://www.uspto.gov/sites/default/files/documents/MRF-Current.pdf>) does not include the explanatory text available to reviewers, which nearly doubles the size of the MRF document from 71 pages (public) to 132 pages (internal).

R2: Direct the Commissioner for Patents to publicly release more of the OPQA review methodology and data to solicit external feedback on the review process.

2.3 USPTO does not meet all the timeliness benchmarks detailed in statute, impacting stakeholders’ right to prompt notice of the patent landscape.

Patent owners, technology implementers, and the public have a right to prompt notice of the patent landscape. To “guarantee...prompt [USPTO] responses” during patent prosecution, Title 35 of the U.S. Code specifies timeframes in which USPTO is to complete certain actions. It awards additional patent term to patent owners “if the issue of the original patent is delayed due to the failure” of USPTO to take timely action.²⁷ USPTO publicly reports pendency measures monthly based on its patent application data. While USPTO is transitioning to the use of PTA-based measures, the two key benchmarks available for this evaluation are:

- First Office Action pendency: Issue an allowance, non-final rejection, or final rejection within 14 months from the filing date.²⁸
- Issue a patent within 36 months from the filing date.

How USPTO Addresses Responsiveness

USPTO leadership’s concerns, and USPTO’s public focus on pendency, raised responsiveness as an area to investigate. USPTO takes several actions to achieve the benchmarks as defined in statute above. First, it incentivizes examiners by setting production and docket management goals as part of its annual performance appraisal. Production goals are intended to ensure actions (e.g., allowances, non-final rejections, final rejections, etc.) are accomplished within the time allotted to the examiner for each application. Docket management measures the examiner’s responsiveness to certain additional actions (e.g., amendments, petitions, continuations, after finals), each having an expected number of days to act. These two measures comprise 60 percent of an examiner’s annual rating, and most monetary awards available to examiners are primarily based on timeliness-related measures.²⁹

Second, the Office of Patent Training (OPT) includes production and docket management in its initial examiner training. Examiners report that the training is helpful in meeting their production goals.³⁰

Finally, USPTO launched its time, routing, and performance appraisal plan (TRP) initiative in October 2020 with a goal of improving responsiveness. The initiative made changes to the time allowed for examination and the definitions and weighting of production and docket

²⁷ 35 U.S.C. § 154(b)(1), Patent Term Adjustment (PTA).

²⁸ “The term ‘pendency’ refers to the fact that the application is pending or awaiting a decision.” “Patents Pendency Data May 2021,” U.S. Patent and Trademark Office, accessed June 30, 2021, <https://www.uspto.gov/dashboard/patents/pendency.html>; 35 U.S.C. § 154(b)(1)(A).

²⁹ Monetary awards to examiners require scoring a “fully successful or better” rating in each PAP category, including quality; however, the Productivity Gainsharing Award and Pendency Award are awarded based primarily on productivity and docket management.

³⁰ To include initial Patent Training Academy training, local technical training, refresher training, and corps-wide training.

management in the examiners' performance appraisal plan (PAP). Examiners' initial reactions to the TRP initiative are mixed; however, its implementation is too recent to draw any conclusions about TRP's impact on responsiveness.³¹

USPTO Pendency Performance

Examiners perform well in the responsiveness-related areas of their performance appraisals. However, overall USPTO is underperforming the statutory benchmarks for first Office Actions. On average, examiners are "fully successful"³² with respect to production, and 93 percent of examiners score "fully successful" or better on their annual performance appraisals. They perform better yet with respect to docket management, for an average docket management score of "commendable" and 98 percent of ratings at or above that level. Additionally, examiners report that the TRP guidance, OPQA feedback, and expectations related to production, docket management, prior art search, and compliance somewhat hinder their ability to meet personal production goals.

However, per USPTO's monthly reporting of pendency for May 2021, First Office Action pendency is at 17 months, time awaiting first action is 14.8 months, and forward-looking first action pendency is 16.2 months (see Table 2-2).³³ These timeframes all exceed the 14-month benchmark. In addition, roughly half of patents issued are awarded a patent term adjustment (PTA) due to USPTO delays, with an average of 121 days of delay; most of which comes from USPTO delays awaiting first action. This discrepancy between examiner performance and overall pendency may indicate issues with incentives or measurement. It could also result in difficulty gauging required workforce levels.

While USPTO focuses on incentivizing and reporting responsiveness, it does not directly gauge patent practitioners' views on USPTO's responsiveness. In the 2021 semi-annual survey of practitioners conducted by USPTO, several practitioners reported in response to an open-ended question that USPTO performs well with respect to accessibility and collaboration as compared to foreign intellectual property (IP) offices. However, USPTO does not solicit quantitative feedback on responsiveness from practitioners.

³¹ Figure D-5 in Appendix D shows the issues found with TRP. This was one of the strongest findings in the survey.

³² The PAP rating levels are: outstanding (5), commendable (4), fully successful (3), marginal (2), and unacceptable (1). A "fully successful rating with respect to production" indicates they achieved between 95 and 102 percent of their individual production goal.

³³ USPTO, "USPTO's Patents Pendency Data May 2021" (webpage), accessed July 27, 2021, <https://www.uspto.gov/dashboard/patents/pendency.html>. The website always displays the most recent available metrics. When accessed on July 27, 2021, for the purposes of this report, it displayed May 2021 pendency data.

Table 2-2. USPTO Pendency Performance for April 2021

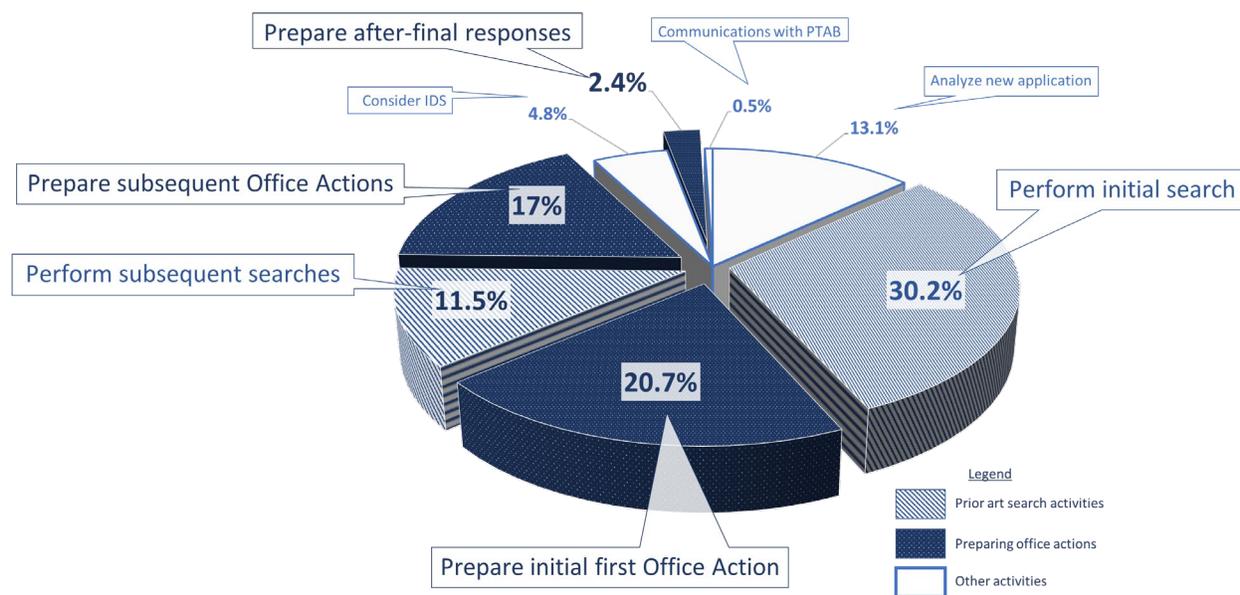
Pendency Measure	Performance	Trend
First Office Action Pendency	17 months	Two-year high; over 14-month benchmark in 35 U.S.C. § 154
Time Awaiting First Action	14.8 months	Seven-year low; holding steady since 2019; over 14-month benchmark in 35 U.S.C. § 154
Traditional Total Pendency	22.8 months	Two-year low; under 36-month benchmark in 35 U.S.C. § 154
Forward-Looking First Action Pendency	16.2 months	Near a two-year high; over 14-month benchmark in 35 U.S.C. § 154

Source: USPTO’s Patents Pendency Data April 2021

Automation Limitations

We observed examiners manually copying-and-pasting a substantial amount of information in the early stages of examination—while analyzing the new application and performing the prior art search—and while preparing Office Actions (see Figure 2-1). Prior art search is required to make defensible determinations of the novelty and non-obviousness of the invention (see also Section 2.6). It is the most time-consuming examination task, comprising 47 percent of pre-first Office Action time and 42 percent of total examination time, according to USPTO. Preparing Office Actions is the second most time-consuming task—32 percent of pre-first Office Action time and 40 percent of total examination time.

Figure 2-1. Examination Time by Common Patent Activities



Source: MITRE redrawing of USPTO-provided chart

Examiners have some tools for automation, but while they reported the tools to be helpful there is still room for improvement. We observed examiners converting scanned document

images of patent specifications to text to copy-paste content to a Word document for searching and analyzing. These manual functions could be automated to add efficiency.

Impacts of Emphasis on Responsiveness

Examiners reported that the heavy focus on timeliness measures (i.e., pendency, production, docket management, and monetary awards) puts significant pressure on them to meet those expectations. This pressure negatively impacts examiner morale and their willingness to collaborate with other examiners to help and to learn (as that will take time away from their production time).

Recommendations

We recommend the Undersecretary of Commerce and Director of the U.S. Patent and Trademark Office:

- R3:** Direct the Commissioner for Patents to solicit external stakeholder feedback on responsiveness as an additional performance indicator and to calibrate incentives and expectations.
- R4:** Direct the Commissioner for Patents to assess the effectiveness of current tools (e.g., those aiding in performing prior art search and preparation of Office Actions) to help examiners perform more efficiently.

2.4 USPTO does not have a reliable means of measuring or controlling examiner consistency.

Consistency is both a high-priority and a challenge for USPTO. The importance of improving consistency (i.e., reliability and predictability) is emphasized throughout USPTO's current strategic plan. One of the USPTO's core objectives is to issue highly reliable patents by, for example, achieving more consistent outcomes through improved training and using data to identify areas for improvement.³⁴

Many patentability requirements are difficult to apply to some patent applications, and courts and commentators often disagree on how stringently they should be applied.³⁵ Stakeholders agree, however, that patent examination should at least be consistent, in that similar applications should be treated comparably even when assigned to different examiners. Inconsistency across examination decisions is unfair to applicants and costly to all stakeholders because it could lead to errors in both allowances and rejections.

Indirect measures suggest inconsistency in examination outcomes

USPTO does not directly measure the consistency of patent examination, such as inter-examiner reliability. In other words, if two examiners were independently given the same patent application, USPTO does not know how often they would reach the same outcome in the

³⁴ USPTO, 2018–2022 Strategic Plan (2018), 6.

³⁵ For example, even if it is clear that two references are part of the prior art, figuring out whether combining them is “obvious” requires some judgment, and different patent examiners or judges may disagree on the answer.

examination process. However, indirect measures suggest inconsistency in examination outcomes.

First, consistency was mentioned as a substantial challenge in interviews with USPTO leadership. One senior-level interviewee identified consistency across the USPTO Patents Organization’s Deputy Commissioners—each with their own oversight over some of the 8,000 examiners—as one of the key challenges facing patent operations. A senior interviewee from OPQA echoed this sentiment, identifying inconsistency as one of the more concerning aspects of the examination process. Another senior interviewee from the Office of Process Improvement noted that procedures are not well-documented nor consistently followed.

Second, registered practitioners surveyed by USPTO reported a lack of consistency across examiners in how patentability criteria are applied. One of the main findings USPTO drew from the survey administered May 2020 to July 2020 is that the agency needs improvement in consistency.³⁶ The survey included an open-ended question which asked “in which areas does the USPTO perform well, and which areas need improvement” compared to international IP offices. One of the top five topics mentioned by respondents was “needs improvement in consistency.” In other countries, practitioners say, patent eligibility issues are mostly applied consistently and more reasonably. Respondents also reported USPTO has more variation in examiner quality, relative to international IP offices. They considered consistency in written correspondence from international IP offices to be more prevalent, while the format of USPTO Office Actions is dependent on the examiner.

Finally, patent examiner leniency varies considerably within TCs, with some examiners who are very likely to grant applications and others who are very likely to reject applications. This variation is substantial enough that economists have been able to use USPTO examiner leniency as an “instrumental variable” for which applications are granted.³⁷ In other words, observers can use which examiner an application is assigned to as a proxy for whether that application will be granted. Some TCs use this variation in allowance rates to identify examiners in need of additional supervision or training.

USPTO currently addresses consistency using internal controls

As described below, the USPTO internal controls that could have the biggest effects on consistency are training and process monitoring.

Training

The Office of Patent Training (OPT) runs a 12-month Patent Training Academy for all new examiners. This training includes 16 weeks of training with OPT, three months of on-the-job training at their TCs, another week of more advanced training with OPT, and a final proficiency exam. The training materials provide comprehensive coverage of the patentability requirements. While new examiners experience one or more “training” applications during labs and exercises, USPTO relies more on training with “live” applications, i.e., real applications

³⁶The percentage of respondents who reported that USPTO rejections were reasonable in terms of consistency “rarely” or only “some of the time” was highest for U.S.C. § 101 (59%) and § 103 (47%), also high for § 112(a) (33%) and § 112(b) (29%), and lower but still a substantial number of practitioners for § 102 (18%).

³⁷ Bhaven Sampat and Heidi L. Williams, “How Do Patents Affect Follow-on Innovation? Evidence from the Human Genome,” *American Economic Review* 109.1 (2019): 203-36.

submitted to USPTO for examination. In either case, trainees are not measured against one another to identify inconsistencies.

USPTO is currently developing an iterative, continuous improvement process for the Patent Training Academy. However, because the revisions are still in progress, we cannot yet determine their efficacy.

Process Monitoring

Regarding process monitoring, the new PAP that became effective in FY2020 is similarly intended to improve consistency of process and outcomes. Under the PAP, examiners are assessed on production (30 percent), quality (30 percent), docket management (30 percent), and professionalism and stakeholder interaction (10 percent). The “quality” measure is focused on making correct patentability decisions which is *related* to consistency. However, examiners are not directly assessed on their consistency (e.g., whether they are outliers in terms of allowance rates).

A process monitoring technique for reducing inconsistency (not currently practiced by USPTO) is parallel evaluation by another frontline employee. A recent review of the evidence base for reducing “inconsistencies in bureaucratic decision making” concluded that parallel evaluation and other ongoing management techniques are more successful than audits and appeals.³⁸ We believe this technique could be applied to USPTO evaluations and may yield similar results.

Recommendations

We recommend the Undersecretary of Commerce and Director of the U.S. Patent and Trademark Office:

- R5:** Direct the Commissioner for Patents to establish regular monitoring of consistency in examination decisions, including trainees’ decisions, by randomly selecting applications for parallel examination.

2.5 USPTO has internal controls for most aspects of the Government Accountability Office (GAO) *Green Book*, but they are not managed as a system of controls.

An effective internal control and an internal control system is important for providing an entity with some assurance that its organizational objectives will be achieved. The Federal Managers’ Financial Integrity Act (FMFIA) requires that federal agencies establish *internal control systems*.³⁹ To comply with these requirements, USPTO releases annual Performance and Accountability Reports (PAR) stating, “USPTO management is responsible for establishing and maintaining effective internal control and financial management systems that meet the

³⁸ Daniel E. Ho and Sam Sherman, “Managing Street-level Arbitrariness: The Evidence Base for Public Sector Quality Improvement,” *Annual Review of Law and Social Science* 13 (2017): 251-272.

³⁹ “An internal control system is a continuous, built-in component of operations...that provides reasonable assurance...that an entity’s objectives will be achieved. [An internal control is] not one event, but a series of actions...[and] and integral part of the operational processes...” U.S. Government Accountability Office, *Standards for Internal Control in the Federal Government GAO-14-705G*, (2014), 5, <https://www.gao.gov/assets/gao-14-704g.pdf>.

objectives of the FMFIA.”⁴⁰ GAO’s *Standards for Internal Control in the Federal Government (Green Book)*⁴¹ recommends these practices be a part of every level of the organization throughout the year. The *Green Book*: (1) provides the criteria for designing, implementing, and operating an effective internal control system; (2) defines the standards for an internal control system; and (3) clarifies the processes that are part of internal control.

An internal control is any process used by management to help an entity achieve its objectives. An oversight body should design, implement, and operate the internal control system. The oversight body makes decisions for the entity to achieve its objectives in alignment with its integrity and ethical values. The oversight body understands the entity’s risks, expectations of stakeholders, and oversees the remediation of deficiencies and provides direction to management. *See Appendix C for more details on the Green Book standards.*

USPTO Key Internal Controls

We identified three *key* internal controls related to achieving an efficient and effective patent examination process: (1) examiner training, (2) quality assurance reviews, and (3) examiner performance management and incentives.

Examiner Training

Management is responsible for providing sufficient training for all employees.⁴² That training should be appropriate and tailored for the different roles and individuals. However, USPTO does not measure the effects of initial patent training on examination performance. This may limit its ability to develop examiners in a way that will allow USPTO to achieve its objective of issuing highly reliable patents.⁴³

Quality Assurance Reviews

Agencies should establish and review performance measures and indicators to validate “the propriety and integrity of both entity and individual performance measures and indicators.”⁴⁴ OPQA fulfills the intent of this control activity, yet it is unclear if the control activity is functioning as intended. As described in Section 2.2, OPQA reviews are the primary measure for quality and compliance of patentability determinations. However, the targets for those measures are not connected to any objective standard or outcome. Additionally, OPQA also faces challenges due to its adversarial relationship with examiners and lack of public transparency.

⁴⁰ USPTO, *FY 2020 U.S. Patent and Trademark Office Performance and Accountability Report*, U.S. Patent and Trademark Office (2021), 26, <https://www.uspto.gov/sites/default/files/documents/USPTOFY20PAR.pdf>.

⁴¹ The *Green Book*, originally published in November 1999 and updated in 2014, is intended to apply to the reporting of a federal agency for the annual FMFIA requirements and set “the standards for an effective internal control system for federal agencies, a crucial safeguard over public resources.” GAO, “Press Release: GAO Issues ‘Green Book’ Update to Help Improve Government Accountability and Performance” (webpage), [gao.gov](https://www.gao.gov/press-release/gao-issues-green-book-update-help-improve-government-accountability-and-performance) (website), September 10, 2014, <https://www.gao.gov/press-release/gao-issues-green-book-update-help-improve-government-accountability-and-performance>.

⁴² GAO, *Standards for Internal Control in the Federal Government*, 31.

⁴³ “Through our second objective, we will put in place those initiatives needed to ensure that actions taken under the first objective to optimize patent examination timeframes are synchronized with our commitment to issue highly reliable patents.” USPTO, *2018-2022 Strategic Plan*, 6.

⁴⁴ GAO, *Standards for Internal Control in the Federal Government*, 47.

Examiner Performance Management and Incentives

Management should recognize that misaligned incentives can yield unintended consequences and should align incentives with the entity's standards of conduct.⁴⁵ USPTO's examiner performance management and incentives prioritize production and docket management,⁴⁶ running counter to the competing priority of issuing high-quality patent decisions. Though the USPTO 2018-2022 *Strategic Plan* emphasizes both pendency and quality, the current incentives may have the unintended consequence of making it more difficult for USPTO to achieve its quality goals.

Management and Oversight of Internal Controls

Although USPTO has internal controls in place, it does not manage internal controls as a system.⁴⁷ USPTO also lacks a formal oversight body for its internal controls, as recommended by the GAO *Green Book*, limiting its ability to manage internal controls as a system. Furthermore, an internal control oversight body could improve the relationship between examiners and OPQA by setting the "tone at the top."⁴⁸ Without an oversight body, USPTO is missing an opportunity to create an internal control system to address the issues noted in this sub-section and make its objectives more achievable.

Recommendations

We recommend the Undersecretary of Commerce and Director of the U.S. Patent and Trademark Office:

- R6:** Direct the Commissioner for Patents to establish and empower a quality control oversight body to create a comprehensive internal control system consistent with the guidance in the GAO *Green Book*.

2.6 Examiners have adequate patent and non-patent prior art search resources, but improvements could have a significant positive impact on effectiveness and efficiency.

Throughout this report we have discussed patent examiner workloads and patentability determinations with respect to prior art search. Prior art can be broadly defined as representing the state of art and includes previous patents and publications. As mentioned in Section 2.3, prior art search is a critically important component of the patent examination process required to make novelty and non-obviousness determinations. Patent practitioners report the greatest

⁴⁵ Id., 32.

⁴⁶ As discussed in the Section 2.3, pendency-related measures (production and docket management) comprise 60 percent of patent examiners' performance appraisal, while *quality* comprises only 30 percent of an examiner's performance rating and 25 percent of a supervisory examiner's (SPE's) performance rating. In addition, all examiner financial incentives (awards) are based mostly on production and docket management.

⁴⁷ I.e., they cannot predict how the effects of changes to one control may interact with the effects of changes to another control.

⁴⁸ The oversight body and management reinforce the commitment to doing what is right, not just maintaining a minimum level of performance necessary to comply with applicable laws and regulations, so that these priorities are understood by all stakeholders, such as regulators, employees, and the public. GAO, *Standards for Internal Control in the Federal Government*, 22.

adherence to rules and procedures for “citing appropriate prior art,” and suggest that the correctness of rejections based on non-obviousness have the highest correlation with overall examination quality. The biggest patent quality risk is that patent-destroying prior art exists, but neither the applicant nor the examiner found it, resulting in erroneous patent grants.

USPTO Prior Art Search

Since examiners spend more time searching prior art than any other activity in the examination process (see Section 2.3), improving prior art search has the most opportunity for positive impact on both effectiveness and efficiency. This includes consideration of improvements to prior art search tools, non-patent literature (NPL) resources, and prior art search training.

Prior art search tools

The Patents End-to-End (PE2E) Search tool—the primary patent search tool—and the examiners’ use of that tool appeared efficient, effective, and easy to use. The examiners’ practices for performing searches also appeared sophisticated and proficient, although examiners’ individual approaches to searching and reviewing the results of each search varied.

At the time of this evaluation, USPTO was piloting its Patents Artificial Intelligence Prototype (PAIP). The tool is viewed favorably by the PAIP pilot users and appeared to add value to search results during the demonstration we received. However, we could not independently assess the technology because USPTO does not require the PAIP contractor to deliver source code nor details on the implementation of the AI models. Specifically, USPTO does not know which AI/machine learning (ML) tools are used, what testing has been done and how, and what data sources were used for training the various components. This lack of transparency risks incorporating undesirable biases into PAIP’s results. For example, suppose the AI/ML model learns from what the examiner clicks on in the search results and tunes future results to that behavior. Examiners may have a conscious or unconscious bias in selecting or avoiding certain sources. If USPTO does not fully understand the model, its data sources, and its learning mechanisms, it cannot compensate for these biases. This could lead to a reduced quality of AI/ML-augmented search results.⁴⁹

Additionally, USPTO does not objectively measure the effectiveness nor the efficiency of any of its prior art search tools. Whether prior art searches have improved as a result of the agency’s continued investment in the tools remains difficult to assess. And as discussed in Section 2.3, examiners are given a limited amount of time to examine patent applications. To decide on an application, they must review an increasing body of prior art. Therefore, improvements to search tools will improve the effectiveness and efficiency of the prior art search.

Non-patent literature (NPL)

In the patents sampled in a 2013 study, 22 percent of cited prior art was NPL, but 94 percent of those references came from applicants, not examiners. Of references added by examiners,

⁴⁹ In its December 2020 report, “Agency Use of Artificial Intelligence,” the Administrative Conference of the U.S. (ACUS) identified the two top issues facing federal agencies in their adoption of AI: (1) transparency and (2) harmful bias. ACUS, “Agency Use of Artificial Intelligence” (webpage), [acus.gov](https://www.acus.gov) (website), December 31, 2020, <https://www.acus.gov/recommendation/agency-use-artificial-intelligence>.

about six percent are NPL.⁵⁰ USPTO's Scientific and Technical Information Center (STIC) maintains Electronic Information Centers (EICs) in each TC whose mission is to assist patent examiners in the patent process by providing fast and accurate prior art searches, document delivery services, the provision of foreign patent copies, translations of foreign documents, and access to NPL in electronic format and in print.

USPTO's current NPL subscription holdings available to examiners align with the top publishers and journals relevant to the TCs. USPTO currently subscribes to content published by 11 out of the top 17 publishers in 14 USPTO-relevant domains. USPTO provides examiners access to documents through subscriptions to one of the three major databases containing conference proceedings and 26 specialized professional associations that publish proceedings.

Despite the resources available to examiners, NPL remains difficult to find and cite due to high volume, multiple languages, pay walls (i.e., subscriptions), relative lack of familiarity to examiners, and varying quality of search capabilities. Importantly, the prior art search tools discussed above do *not* include NPL; examiners must search for NPL via an internet search engine or through the search capabilities provided by each publisher or database.

Training

As noted in Section 2.2, we reviewed all the training material USPTO uses in its initial Office of Patent Training (OPT) (Patent Academy) training. The training includes prior art search-specific modules on planning a search, search strategies, two search "labs" where students practice with a mock application in a specific technology area, and a more generic set of exercises which include search. Other modules teach what qualifies as prior art and the application of prior art in determining novelty and non-obviousness.

However, our observations of examiners indicate prior art search is more of an art than a science. While training provides the basics of the search tools and practices, only through experience will an examiner become proficient in searching for prior art. Additionally, because PAIP is still in a pilot phase, its use is not taught during initial training, exacerbating the prior art search skill gap between new examiners and experienced examiners.

Recommendation

R7: Direct the Office of Patent Automation to define objective measures of effectiveness for the search tools and training to inform decisions related to prior art search improvements.

⁵⁰ Christopher A. Cotropia, Mark A. Lemley, and Bhaven Sampat. "Do Applicant Patent Citations Matter?" Research Policy 42.4 (2013): 844-854.

3 Conclusion

Our findings are primarily related to OPQA reviews, USPTO timeliness benchmarks and examiner workloads, and consistency across the patent examination process. We found that although USPTO's examination process complies with applicable statutes, regulations, and case law, its quality review practices may not provide an accurate measure of patent examination quality. Second, USPTO is not meeting all the timeliness benchmarks detailed in statute, impacting stakeholders' right to prompt notice of the patent landscape. Additionally, USPTO does not have a reliable means of measuring and controlling consistency.

We also identified areas for improvement with internal controls and prior art search. While USPTO has internal controls that align with most aspects of the Government Accountability Office (GAO) *Green Book*, they are not managed as a system of controls. Finally, examiners have adequate patent and non-patent prior art search resources, but improvements could have a significant positive impact on examiner training, workloads, and outcomes.

4 Summary of Recommendations

To address the findings in this report, we recommend the Undersecretary of Commerce and Director of the U.S. Patent and Trademark Office:

- R1:** Direct the Commissioner for Patents to (1) measure the effectiveness of the OPQA process and its targets, and (2) take appropriate action to remedy any shortcomings.
- R2:** Direct the Commissioner for Patents to publicly release more of the OPQA review methodology and data to solicit external feedback on the review process.
- R3:** Direct the Commissioner for Patents to solicit external stakeholder feedback on responsiveness as an additional performance indicator and to calibrate incentives and expectations.
- R4:** Direct the Commissioner for Patents to assess the effectiveness of current tools (e.g., those aiding in performing prior art search and preparation of Office Actions) to help examiners perform more efficiently.
- R5:** Direct the Commissioner for Patents to establish regular monitoring of consistency in examination decisions, including trainees' decisions, by randomly selecting applications for parallel examination.
- R6:** Direct the Commissioner for Patents to establish and empower a quality control oversight body to create a comprehensive internal control system consistent with the guidance in the GAO *Green Book*.
- R7:** Direct the Office of Patent Automation to define objective measures of effectiveness for the search tools and training to inform decisions related to prior art search improvements.

5 Summary of Agency Response

In response to our draft report, USPTO concurred with recommendations 1-3 and 5-7 and partially agreed to recommendation 4. For recommendation 4, USPTO suggested we redirect the recommendation from the OCIO to the Commissioner for Patents. We reviewed the recommendation and have revised the report accordingly. In addition, USPTO objected to our second finding regarding OPQA reviews. We have included USPTO's formal comments in Appendix G.

In taking exception to our finding that its OPQA quality review practices may not provide an accurate measure of patent examination quality, USPTO objects to the "inference of inaccurate measurements." The scope of our review excluded audits of USPTO decisions with respect to specific patent applications, so we did not attempt to assess the error rate of OPQA decisions. Rather, our concern is that USPTO does not attempt to measure the effectiveness of OPQA reviews, so it is unclear whether the current OPQA process is an efficient use of stakeholder resources. The inconsistencies we note in Section 2.2 suggest that a more in-depth study of the OPQA process would be beneficial and the accompanying recommendation reflects this.

We appreciate the courtesies extended by USPTO personnel at all levels during the course of this evaluation.

Appendix A *Objectives, Scope, and Methodology*

We conducted this evaluation between October 15, 2020, and May 3, 2021, in accordance with the *Quality Standards for Inspection and Evaluation*.⁵¹ Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our review objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our review objectives. The Office of the Inspector General (OIG) provided oversight to ensure the work was completed in compliance with the Council of the Inspectors General on Integrity and Efficiency guidance.

A.1 Objectives

In its October 1, 2020, announcement memo to USPTO,⁵² OIG laid out the three main objectives of this evaluation:

1. **Compliance:** Assess whether patents are examined in compliance with applicable statutes, regulations, and case law.
2. **Deficiencies:** Identify deficiencies within the examination process impacting the quality of patents granted.
3. **Areas for improvement:** Identify areas for improvement within the examination process to increase its effectiveness and efficiency.

A.2 Scope

The scope of this evaluation included the patent examination process from initial filing through to disposition of the application (allowance, rejection, or abandonment). It covered manual and automated internal controls within the patent examination process, and focused on process, tools, and incentives.

We assessed compliance with applicable statutes, laws, regulations, and policy—specifically Title 35 of the U.S.C. and Title 37 of the Code of Federal Regulations. We also considered case law, where applicable. Data used for analysis included patent applications filed from 2010 through 2020, and performance-related data provided by USPTO.

Specifically *not* in scope for this evaluation were (1) recruiting, hiring, and non-performance-related activities relative to patent examiners and (2) actual patent application allowance/rejection decisions (i.e., this was not an audit of past or current Office Actions or patent applications).

A.3 Methodology

We conducted this evaluation in three phases from October 2020 through September 2021. In the Planning Phase (October–December 2020), we collected and reviewed literature and

⁵¹ Council of the Inspectors General on Integrity and Efficiency, *Quality Standards for Inspection and Evaluation*, 2020, <https://www.ignet.gov/sites/default/files/files/QualityStandardsforInspectionandEvaluation-2020.pdf>.

⁵² U.S. Department of Commerce Office of the Inspector General, Memorandum, “Evaluation of USPTO’s Patent Examination Process,” 2020, <https://www.oig.doc.gov/OIGPublications/Evaluation-of-USPTOs-Patent-Examination-Process.pdf>.

documentation, requested data from USPTO, performed a series of interviews of senior leadership at USPTO, and planned the Fieldwork Phase. During Fieldwork (January 2021–April 2021), we continued our literature and documentation review, drafted working papers, conducted more interviews, developed, administered, and analyzed the results of a survey of patent examiners, and analyzed data. Finally, in the Reporting Phase (May 2021–September 2021), we drafted this report, completed the supporting data analysis, delivered the pre-exit and exit conferences to USPTO, and finalized our working papers for OIG’s records.

A.3.1 Literature, Document, and Report Review

Over the course of the Planning and Fieldwork Phases, we collected research papers, journal articles, official publications, and internal documents and reports related to the patent examination process. These included non-public system description documents, internal USPTO survey results, briefings, and performance reports generated by USPTO. We received from USPTO and reviewed all the Office of Patent Training (OPT) (Patent Academy) material used for initial examiner training, and details on the time, routing, and performance appraisal plan (TRP) initiative. USPTO also provided us with its results on previous organizational surveys and its semi-annual practitioner survey.

A.3.2 Interviews and Demos

During this evaluation, we conducted a total of 72 interviews, and nine demonstrations of the use of the Patents End-to-End (PE2E) systems in the execution of the patent examination process.

Planning Phase Interviews (October–December 2020)

During the Planning Phase, we conducted 28 interviews with most of the key leadership in the Patents organization. The goal of these interviews was to understand each leader’s perspective on the patent examination process, their organizations’ roles, goals, and metrics relative to the patent examination process, and to gather recommendations on additional people MITRE should talk to, and additional data or information MITRE should be looking at.

These interviews included the Commissioner for Patents, four Deputy Commissioners for Patents, and leadership and staff in the following roles, or from the following organizations:

- Acting Chief Data Officer
- Acting Director, Office of Data Management
- Acting Director, Office of Patent Automation
- Administrator, Office of Patent Stakeholder Experience
- Assistant Commissioner, Office of Patent Information Management
- Assistant Deputy Commissioner for Patent Operations
- Chief Data Analytics Officer, Office of Patent Planning and Data Analysis
- Chief Patent Statistician
- Customer Experience Administrator, Office of Patent Stakeholder Experience

- Director, Office of Patent Application Processing
- Director, Office of Patent Quality Assurance
- Director, Office of Patents Stakeholder Experience
- Director, Office of Process Improvement (including a follow-up interview)
- Editor, Manual of Patent Examining Procedure
- Management Quality Assurance Specialist, Office of Patent Training
- Office of Patent Automation
- Office of Patent Training
- Product Owner, DOCX
- Product Owner, Patents Artificial Intelligence Prototype
- Product Owner, Patents End-to-End (PE2E) Search
- Special Advisor to the Under Secretary of Commerce for Intellectual Property
- Technical Operation Review Program Manager, Office of Patent Examination Support Services

Fieldwork Phase Interviews (January–April 2021)

In the Fieldwork Phase, we selected key individuals for interviews to pursue topics of interest (e.g., related to the TRP initiative). We completed the leadership interviews by interview people in the following roles or from these organizations:

- Chief Information Officer
- Chief Technology Officer
- Director, Office of Classification
- Office of Patent Information Management
- Supervisor, Patent Automation Support Manager
- Temporary Acting Director, Office of Patent Legal Administration
- The fifth of the five Deputy Commissioner for Patents

We also conducted four follow-up interviews with the following leaders:

- Director, Office of Patents Stakeholder Experience
- Director, Office of Patent Quality Assurance
- Director, Office of Process Improvement
- Chief Patent Statistician

USPTO supplied complete rosters of patent examiners (9,092 names, including SPEs), Review Quality Assurance Specialists (RQASs) and Training Quality Assurance Specialists (TQASs), and User Centered Design Council (UCDC) members. We created a list of TC directors from the

USPTO website.⁵³ To select individuals for each type of interview we assigned a random number to everyone in candidate lists provided by USPTO. We then sorted each list by the random number and selected the names with the highest number in the categories desired (e.g., one TQAS in each of the “operational”⁵⁴ TCs).

We interviewed representatives from each of the following “populations” for interviews focused on their perspectives in their respective roles:

- Review Quality Assurance Specialist, Office of Patent Quality Assurance (three individuals)
- Supervisory Patent Examiner (SPE) (eight individuals)⁵⁵
- Technical Center Director (11 individuals)⁵⁶
- Technical Center Quality Assurance Specialist (nine individuals)
- User-centered Design Council (two individuals)

Demonstrations

For the PE2E demonstrations, we asked USPTO to provide us with a list of ten Primary Patent Examiners from each TC who can provide a demo of PE2E (all features, including search), and all the available search tools. We selected, at random, one examiner from each of the nine operational TCs to provide us a demo remotely (due to pandemic restrictions). In addition, an individual from the Office of Patent Automation provided a demonstration of the Patents AI Prototype capability and answered our questions about its features and use.

Where an individual was on multiple rosters, we were careful to only interview them once from the perspective of one role. For each interview, we collected notes, and screenshots when useful (e.g., in the demos). We captured observations from each of these interviews as a source for the evaluation’s findings.

A.3.3 Patent Examiner Survey

MITRE conducted a patent examiner survey to learn more about patent examiner perceptions of five human capital-related internal controls: examiner tools, guidance and feedback, performance expectations, financial incentives, and training and development. The survey was aimed at addressing four research questions related to overall compliance, compliance with specific statutes, personal production goals, and expectations conflict. See Appendix D for a full discussion of the survey.

⁵³ USPTO, “Patents Technology Centers Management” (web page), uspto.gov (website), accessed on June 1, 2021, <https://www.uspto.gov/patents/contact-patents/patent-technology-centers-management>.

⁵⁴ Tech Centers 1600, 1700, 2100, 2400, 2600, 2800, 2900, 3600, and 3700. We did not include TC 4100, the training TC, nor individuals in the Central Reexamination Unit, since those organizations are smaller and not necessarily representative of the broader examiner corps.

⁵⁵ Due to scheduling conflicts, we were unable to interview an SPE from TC 3600.

⁵⁶ Including a director from TC 4100, and two directors from TC 1600, due a mix-up in scheduling.

A.3.4 Sampling Plan

We designed our sampling of USPTO staff—in particular, the examiner corps—to be representative across TCs and grade levels, while also affording reasonably precise statistical estimates overall and for each TC. See Section D.2 for details on the sampling distributions for the survey.

The survey was administered to the examiner sample through the Federal Risk and Authorization Management Program (FedRAMP)⁵⁷ online platform for survey administration. The survey launched on March 8, 2021 and closed ten business days later on March 19, 2021.

A.3.5 Data Analysis

Table A-1 summarizes of the data analysis we performed as part of this evaluation. Except where noted, we received the data sources from USPTO directly in response to our requests. Except where noted, the data was USPTO-internal data (i.e., non-public). We recorded observations from each analysis activity and used those to inform our overall set of findings and recommendations.

Table A-1 Summary of Data Analysis Sources and Outputs

Data Source	Scope	Purpose of Analysis
2018 Federal Employee Viewpoint Survey (FEVS) results	Patents organization; administered 2018	Identify any problem areas to guide our initial research and to support or refute our findings; look for variations across Technology Centers.
2019 FEVS results	Patents organization; administered 2019	Identify any problem areas to guide our initial research and to support or refute our findings; look for variations across Technology Centers.
2020 People Survey results	Patents organization; administered 2020	Identify any problem areas to guide our initial research and to support or refute our findings; look for variations across Technology Centers.
AIA trial data	AIA trials petitioned from 9/16/2012 through 5/11/2021	Identify distribution of claims found unpatentable or upheld by PTAB.

⁵⁷ “FedRAMP is a government-wide program that promotes the adoption of secure cloud services across the federal government by providing a standardized approach to security and risk assessment for cloud technologies and federal agencies.” “Program Basics,” FedRAMP.gov, accessed August 19, 2021, <https://www.fedramp.gov/program-basics/>.

Data Source	Scope	Purpose of Analysis
Classification contractor performance data	Performance data for both classification contractors for the periods of March 2019 through November 2020	Assess comparative contractor error-rate performance and performance against contracted error-rate thresholds.
CPC mailbox log	CPC email received April 2020 through April 2021	Identify the source and frequency of messages to the CPC Mailbox and look for patterns
C-star challenge data	2 Oct 2020 through 10 Mar 2021	Determine if there is any indication of trends in accuracy or impact on responsiveness.
Customer service logs and metrics	Dec 2020 and Jan 2021 extracts of call logs and metrics	Identify any patterns or trends related to the quality of the patent examination process.
Inventors Assistance Center (IAC) metrics	IAC monthly progress reports for Jan, Feb, and Mar 2021	Analyze the Inventors Assistance Center for any patterns or trends related to the quality of the patent examination process.
NPL Resources available to examiners⁵⁸	NPL electronic resources; does not consider USPTO print resources or patent databases; resources used for text searching and does not include resources for chemical structures or genetic sequences. Public sources access throughout February and March 2021.	Assesses the quality and content coverage of USPTO NPL electronic resources that USPTO provides to examiners to conduct prior art searches.
Office of Data Management ODM metrics	Notice of Allowance to Patent Issue durations FY06 – FY20	Identify any delays in issuing patents after notice of allowance.

⁵⁸ USPTO, “Electronic Non-Patent Literature Available at the USPTO” (web page), uspto.gov (website), accessed June 30, 2021, <https://www.uspto.gov/learning-and-resources/support-centers/scientific-and-technical-information-center-stic/electronic>; USPTO, “Commercial Databases Available at USPTO” (web page), uspto.gov (website), accessed June 30, 2021, <https://www.uspto.gov/learning-and-resources/support-centers/scientific-and-technical-information-center-stic/commercial>.

Data Source	Scope	Purpose of Analysis
Office of Patent Application Processing OPAP metrics	Initial patent application processing data for FY20 utility patent applications and FY19 design and provisional applications	Determine error rates on the part of applicants and responsiveness on the part of OPAP.
OPQA quality review results	Quality Index Review (QIR) for FY20; IQS Dashboard Data, Oct 2019 through Feb 2021	Identify and understand variations across Tech Centers, and possible problem areas.
Patent automation support manager problem reporting log	PASM reports and resolution: Mar 2020 – Mar 2021	Identify any patterns or trends related to the quality of the patent examination tools.
Patent Examination Research Dataset (public data)	PatEx data for applications filed between Jan 2010 and Oct 2019	Calculate distributions of applications across various strata to support other analysis. Analyze timelines for a sampling of applications.
Patent examiner hiring, attrition, and performance appraisal data	Hiring & attrition data: 2010 – 2020 Performance appraisal data: FY 2020	Analyze the hiring, attrition, and TC quality review statistics for outliers, trends, and consistency of performance across Tech Centers.
Patent examiner roster	Snapshot of all patent examiners as of 1 Oct 2020	Select candidates for interviews, demonstrations, and survey participation, and provide examiner demographics for other data analysis.
Petitions data	Petition decisions from Feb 2009 through Mar 2021	Analyze any trends or patterns in petition types and decisions.
Roster of Quality Assurance Specialists	Snapshot of Quality Assurance Specialists in Nov 2020	Build a representative random sample of MQAS' and TQAS' for fieldwork interviews.
RUSH Report data	Summary statistics covering ODM reports to OPESS between 4/30/2010 – 12/4/2020	Analyze the RUSH report for patterns, trends, or other insights.

Data Source	Scope	Purpose of Analysis
SPE review data	SPE turnaround data provided by USPTO detailing reviews accomplished across all Tech Centers from Jan 1, 2020, through March 23, 2021 (over 700,000 Office Actions reviewed)	Analyze the SPE review records to determine if there are any trends in the quality or timeliness of the reviews performed at each TC before Office Actions are mailed.
UCDC PAIP Pilot Survey results	Survey conducted June 2020; 762 respondents	Analyze result of the UCDC survey of the PAIP tool.
USPTO Practitioners' Survey and responses	Summer 2020	Independently analyze results of USPTO's semi-annual practitioner survey.

Source: MITRE

Appendix B *Patent Examination Process Statute*

This section details the relevant patent examination process statute.

- **35 U.S.C. § 101 Inventions Patentable**⁵⁹

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

- **35 U.S.C. § 102 Conditions for Patentability; Novelty**⁶⁰

(a) NOVELTY: PRIOR ART.—A person shall be entitled to a patent unless—

- (1) the claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention; or
- (2) the claimed invention was described in a patent issued under section 151, or in an application for patent published or deemed published under section 122(b), in which the patent or application, as the case may be, names another inventor and was effectively filed before the effective filing date of the claimed invention.

(b) EXCEPTIONS.—

(1) DISCLOSURES MADE 1 YEAR OR LESS BEFORE THE EFFECTIVE FILING DATE OF THE CLAIMED INVENTION.—A disclosure made 1 year or less before the effective filing date of a claimed invention shall not be prior art to the claimed invention under subsection (a)(1) if—

- (A) the disclosure was made by the inventor or joint inventor or by another who obtained the subject matter disclosed directly or indirectly from the inventor or a joint inventor; or
- (B) the subject matter disclosed had, before such disclosure, been publicly disclosed by the inventor or a joint inventor or another who obtained the subject matter disclosed directly or indirectly from the inventor or a joint inventor.

(2) DISCLOSURES APPEARING IN APPLICATIONS AND PATENTS.—A disclosure shall not be prior art to a claimed invention under subsection (a)(2) if—

- (A) the subject matter disclosed was obtained directly or indirectly from the inventor or a joint inventor;
- (B) the subject matter disclosed had, before such subject matter was effectively filed under subsection (a)(2), been publicly disclosed by the inventor or a joint inventor or another who obtained the

⁵⁹ 35 U.S.C. § 101.

⁶⁰ 35 U.S.C. § 102.

subject matter disclosed directly or indirectly from the inventor or a joint inventor; or

(C) the subject matter disclosed and the claimed invention, not later than the effective filing date of the claimed invention, were owned by the same person or subject to an obligation of assignment to the same person.

(c) COMMON OWNERSHIP UNDER JOINT RESEARCH AGREEMENTS.—Subject matter disclosed and a claimed invention shall be deemed to have been owned by the same person or subject to an obligation of assignment to the same person in applying the provisions of subsection (b)(2)(C) if—

(1) the subject matter disclosed was developed and the claimed invention was made by, or on behalf of, 1 or more parties to a joint research agreement that was in effect on or before the effective filing date of the claimed invention;

(2) the claimed invention was made as a result of activities undertaken within the scope of the joint research agreement; and

(3) the application for patent for the claimed invention discloses or is amended to disclose the names of the parties to the joint research agreement.

(d) PATENTS AND PUBLISHED APPLICATIONS EFFECTIVE AS PRIOR ART.—For purposes of determining whether a patent or application for patent is prior art to a claimed invention under subsection (a)(2), such patent or application shall be considered to have been effectively filed, with respect to any subject matter described in the patent or application—

(1) if paragraph (2) does not apply, as of the actual filing date of the patent or the application for patent; or

(2) if the patent or application for patent is entitled to claim a right of priority under section 119, 365(a), 365(b), 386(a), or 386(b), or to claim the benefit of an earlier filing date under section 120, 121, 365(c), or 386(c) based upon 1 or more prior filed applications for patent, as of the filing date of the earliest such application that describes the subject matter.

- **35 U.S.C. § 103 Conditions for Patentability; Non-obvious Subject Matter**⁶¹

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

⁶¹ 35 U.S.C. § 103.

- **35 U.S.C. § 112 Specification**⁶²

- (a) **IN GENERAL.**—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.
- (b) **CONCLUSION.**—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.
- (c) **FORM.**—A claim may be written in independent or, if the nature of the case admits, in dependent or multiple dependent form.
- (d) **REFERENCE IN DEPENDENT FORMS.**—Subject to subsection I, a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.
- (e) **REFERENCE IN MULTIPLE DEPENDENT FORM.**—A claim in multiple dependent form shall contain a reference, in the alternative only, to more than one claim previously set forth and then specify a further limitation of the subject matter claimed. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim. A multiple dependent claim shall be construed to incorporate by reference all the limitations of the particular claim in relation to which it is being considered.
- (f) **ELEMENT IN CLAIM FOR A COMBINATION.**—An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

⁶² 35 U.S.C. § 112.

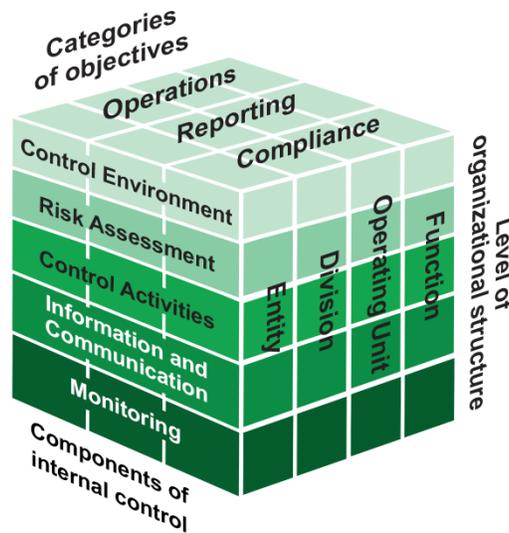
Appendix C *Government Accountability Office (GAO) Green Book*

C.1 What Is the GAO Green Book?

In response to the need to improve accountability for an entity achieving its mission, GAO published its *Standards for Internal Control in the Federal Government* or the “*Green Book*” in September 2014. This version of the *Green Book* was a reissue with updates to the 1999 version. The *Green Book* establishes the internal control criteria for an entity to provide Federal managers with requirements for designing, implementing, and operating an internal control system.

The *Green Book* states that “an entity uses the *Green Book* to design, implement, and operate internal controls to achieve its objectives related to operations, reporting, and compliance.” Its requirements are part of the Components and associated Principles that indicate what the entity needs to accomplish.

Figure C-1. GAO Green Book Internal Control Framework



Source: GAO, *Standards for Internal Control in the Federal Government*

C.2 What Is an Internal Control?

The *Green Book* defines an internal control as “a process used by management to help an entity achieve its objectives.” An internal control is intended to increase the likelihood that the entity will accomplish the established objectives.

The steps for achieving an objective using an internal control system begin with ensuring that the objectives have been identified by the entity’s leadership. The next step is to design the appropriate internal controls that are needed for the identified objectives. The third step in the process is to put the internal controls in place within the entity so they are actionable and have the required oversight. The final step is for the entity to achieve the identified objectives. By

having an internal control system in place, the entity will better be able to achieve these objectives.

C.2.1 Objectives of an Internal Control System

Overall, the objectives should (1) meet the entity's mission, strategic plan, and goals and requirements; (2) be in compliance with the applicable laws and regulations; (3) be set before the entity designs the internal controls; and (4) be specific and measurable. The *Green Book* framework includes the following three categories of objectives:

- **Operations**
 - Part of the process for achieving an entity's mission.
 - May be articulated in an official strategic plan where goals and objectives for the entity are established.
- **Reporting**
 - Satisfies requirements for reports for use by the entity, its stakeholders, or other external parties.
 - Internal reporting objectives are related to information that the entity needs for decision-making and performance evaluation.
- **Compliance**
 - Management decides the laws and regulations with which the entity must comply.
 - Management sets the entity's objectives while incorporating requirements from laws and regulations to ensure compliance.

Appendix D *Patent Examiner Survey Summary Results*

MITRE conducted a patent examiner survey to learn more about patent examiner perceptions of five human capital related internal controls: examiner tools, guidance and feedback, performance expectations, financial incentives, and training and development.

The survey was specifically aimed at addressing four research questions:

1. **Overall Compliance:** What elements of these five internal controls do patent examiners commonly perceive as particularly helpful or hindering in issuing Office Actions that are compliant with the legal requirements of determining patentability?
2. **Compliance with Specific Statutes:** To what extent do these patent examiner perceptions vary by statute?
3. **Personal Production Goals:** What elements of these five internal controls do patent examiners commonly perceive as particularly helpful or hindering in meeting their personal production goals?
4. **Expectations Conflict:** To what extent do performance expectations conflict with one another?

D.1 Survey Instrument

The survey instrument was designed to examine patent examiner perceptions of all five internal controls related to human capital management. A pool of questions was formulated and refined by all members of the MITRE team, led by a survey and measurement expert.

Refinements to the instrument were made using feedback provided by the OIG team, USPTO team, and union representatives with the goals of ensuring that the survey reflected the objectives of the evaluation, was framed and structured appropriately, and contained a comprehensive set of questions about internal controls that would be inoffensive and easily understandable to patent examiners.

We refined and finalized the survey by conducting a “thinkaloud” exercise separately with three patent examiners. This exercise was used to identify changes required to make sure the prior review actions succeeded in their goals. The thinkaloud procedure consisted of having the examiner complete the survey, taking a mental note of any particularly confusing, unclear, or concerning questions. We then walked through the survey with each examiner, noting their concerns and making sure that there weren’t any miscategorized or missing questions for each internal control. Examiner feedback was used to make final refinements to the survey instrument.

The final survey consisted of four sections of ratings and open-ended questions and was approved by OIG and relevant compliance offices at MITRE.

- **Section 1: Occupational information.** This section consisted of two questions about the respondent’s role as a patent examiner: TC affiliation and level of signatory authority.
- **Section 2: Overall compliance.** This section consisted of five question blocks, each asking respondents to rate the extent to which elements of one internal control (i.e., elements of tools, guidance and feedback, performance expectations, financial incentives, and

training and development) helped or hindered examiners in “issuing Office Actions that are compliant with the legal requirements of determining patentability.” Respondents used 5-point rating scale from “hinders a lot” to “helps a lot” to report their perceptions, along with a “not applicable” option. Each block was followed by an open-ended question that allowed respondents to elaborate on the internal control element(s) that most helped or hindered.

- Section 3: Compliance with specific statutes. This section consisted of five question blocks, each asking respondents to rate the extent to which each overall internal control helped or hindered them in issuing Office Actions that were compliant with specific statutes (i.e., 101, 102, 103, 112(a), 112(b)).
- Section 4: Personal production goals. This section was identical to Section 2 but asked respondents to rate the extent to which elements of each internal control helped or hindered them in “meeting [their] personal production goals.”

D.2 Sample

As discussed in Section A.3.4, we designed the sample of 1,953 patent examiners (assuming a 40 percent response rate) to be representative across TCs and experience levels, while affording reasonably precise statistical estimates overall and for each TC.

We filtered out supervisory patent examiners (SPEs), examiners in TC 4100, and anyone we planned to interact with (i.e., interview or receive a demo from) from the full roster of examiners provided to us by USPTO. We then binned the remaining 8,038 examiners into nine TC bins and three grade bins to ensure our sample included individuals across all TCs and with varying levels of experience: GS07 through 12, GS13, and GS14 and 15. The population of qualifying examiners, from which we sampled, is shown in Table D-1. Each number in the table represents the total number of examiners in this population belonging to one of the 27 bins (i.e., nine TC bins distributed across three grade bins).

Table D-1. Patent Examiner Survey Population

Tech Center	GS07 through GS12	GS13	GS14 or GS15	Total
1600	50	83	444	577
1700	134	145	631	910
2100	179	162	514	855
2400	163	194	611	968
2600	54	80	755	889
2800	164	193	890	1,247
2900	54	43	107	204
3600	301	186	715	1,202
3700	328	228	630	1,186
Grand Total	1,427	1,314	5,297	8,038

Source: MITRE sampling and calculations

To select our sample from this population, we conservatively assumed we would receive a survey response rate of 40 percent and targeted a margin of error of ten percent. As a result, we randomly selected 1,953 examiners, who were then randomly selected from within each bin Table D-2 in proportions identical to those in the population Table D-1. The composition of the resulting sample is shown in Table D-2.

Table D-2 Patent Examiner Survey Sample

Tech Center	GS07 through			Total
	GS12	GS13	GS14 or GS15	
1600	19	30	161	210
1700	33	35	152	220
2100	46	42	132	220
2400	38	45	139	222
2600	14	20	186	220
2800	30	35	161	226
2900	49	39	98	186
3600	56	35	133	224
3700	62	44	119	225
Total	347	325	1,281	1,953

Source: MITRE sampling and calculations

D.3 Administration and Response

We administered the survey to the examiner sample through the FedRAMP online platform for survey administration.⁶³ Examiners were invited to charge one hour of their time completing the survey to AEVALU-0000-A00176, Support OIG Examinations. The survey launched on March 8, 2021 and closed ten business days later on March 19, 2021.

Response rates across the sample, as well as within each TC and experience level (i.e., level of signatory authority) indicated that strong claims can be made about the entire patent examiner population based on the survey results. Generally, response rates were very high (73 percent; of the 1,953 patent examiners invited to respond, 1,417 completed the survey), and the characteristics of these respondents closely mirrored those of the population of patent examiners.

The percentages of respondents belonging to each TC are shown in Table D-1. Of respondents who provided their level of signatory authority, 69 percent reported having full signatory authority, 25 percent reported having no signatory authority, and six percent reported having partial signatory authority.

⁶³ Qualtrics CoreXM. "FEDRAMP MARKETPLACE," FedRAMP.gov, accessed August 19, 2021, <https://marketplace.fedramp.gov/#!/products?sort=productName&productNameSearch=qualtrics>.

Table D-3. Composition of the Respondents and Population by Technology Center

Technology Center	Number of Respondents	Percentage of Total Respondents	Percentage of Total Population
1600	165	10.8%	11.6%
1700	159	11.3%	11.2%
2100	137	11.3%	9.7%
2400	171	11.4%	12.1%
2600	162	11.3%	11.4%
2800	152	11.6%	10.7%
2900	133	9.5%	9.4%
3600	170	11.5%	12.0%
3700	168	11.5%	11.9%

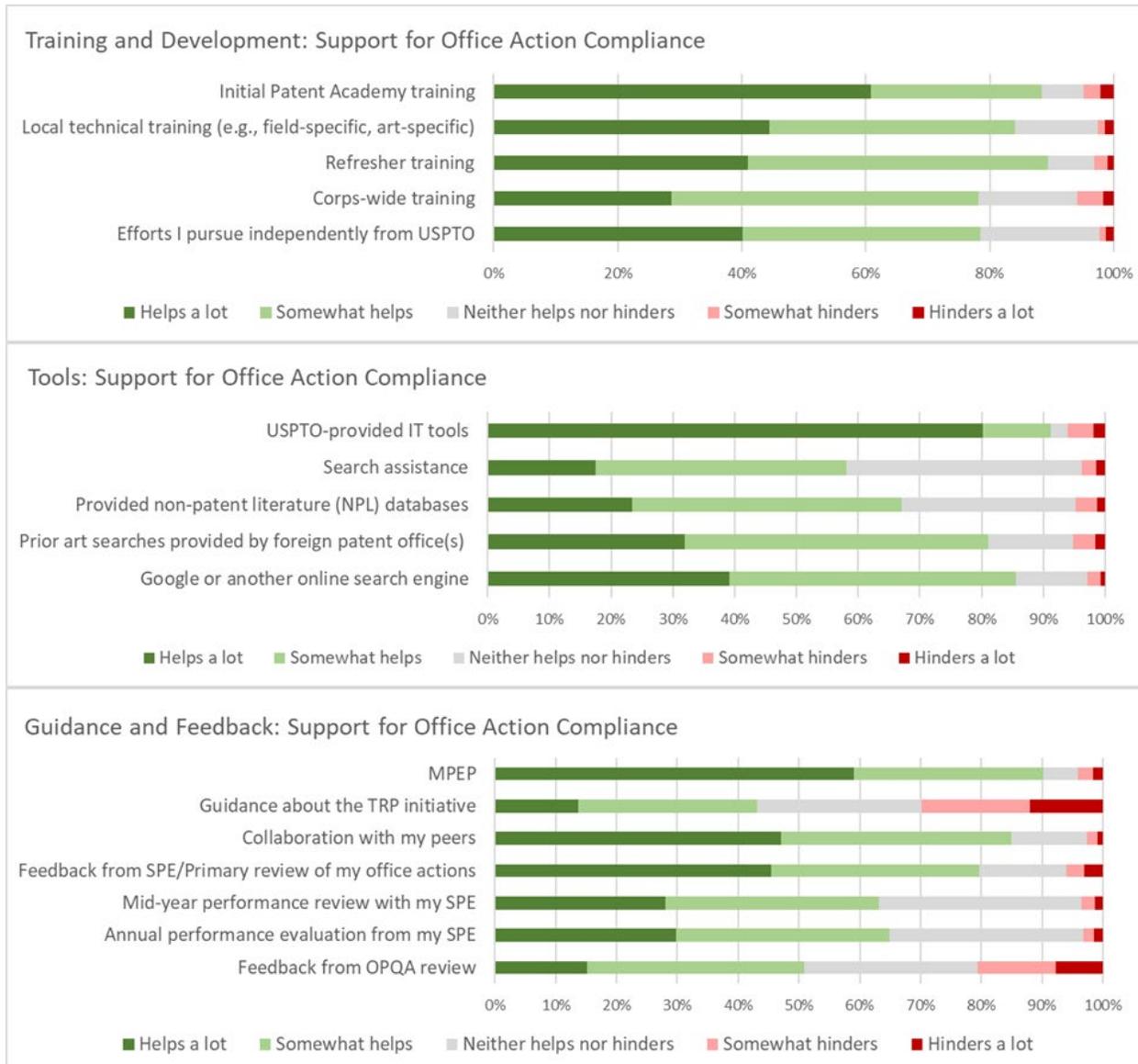
Source: MITRE

D.4 Results

D.4.1 Research Question 1: Overall Compliance

As shown in Figure D-1, training and development, tools, and most elements of guidance and feedback were most frequently perceived by examiners as helpful to compliance. Elements perceived as most useful within each of these internal controls were initial Patent Academy training, USPTO-provided IT tools, and MPEP.

Figure D-1. Controls Perceived as *Helpful* to Compliance

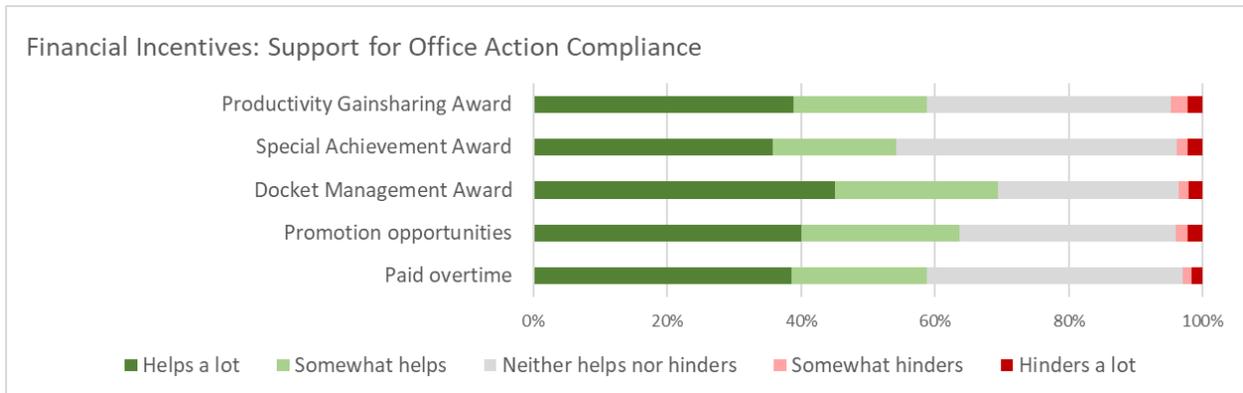


Source: MITRE

Financial incentives were not seen by many examiners to be a hindrance to compliance, but also were not seen strongly as helping compliance (see Figure D-2). Conversely, as compared to other internal controls, performance expectations were more frequently perceived as a

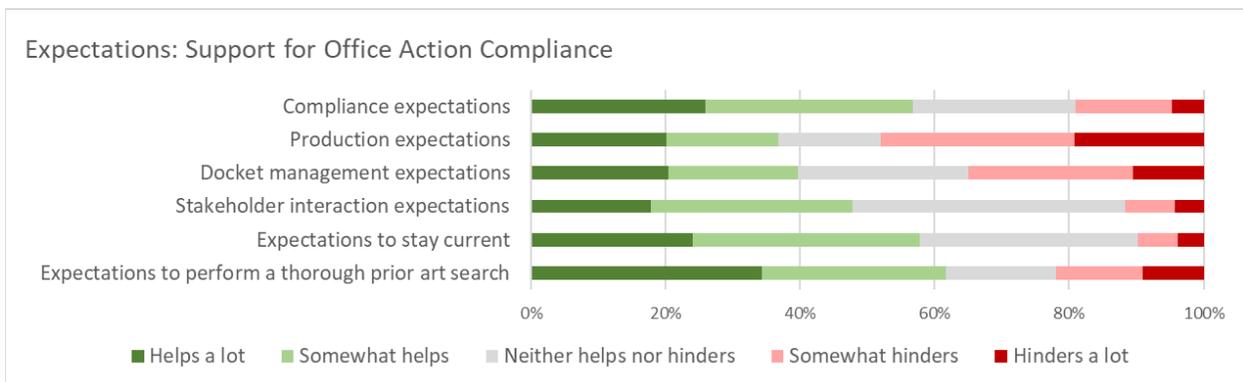
hindrance to compliance (see Figure D-3). Two elements of guidance and feedback were also more frequently perceived as a hindrance: TRP guidance and OPQA feedback (see Figure D-1).

Figure D-2. Control Perceived as *Not a Hindrance* to Compliance



Source: MITRE

Figure D-3. Control Perceived as a *Hindrance* to Compliance

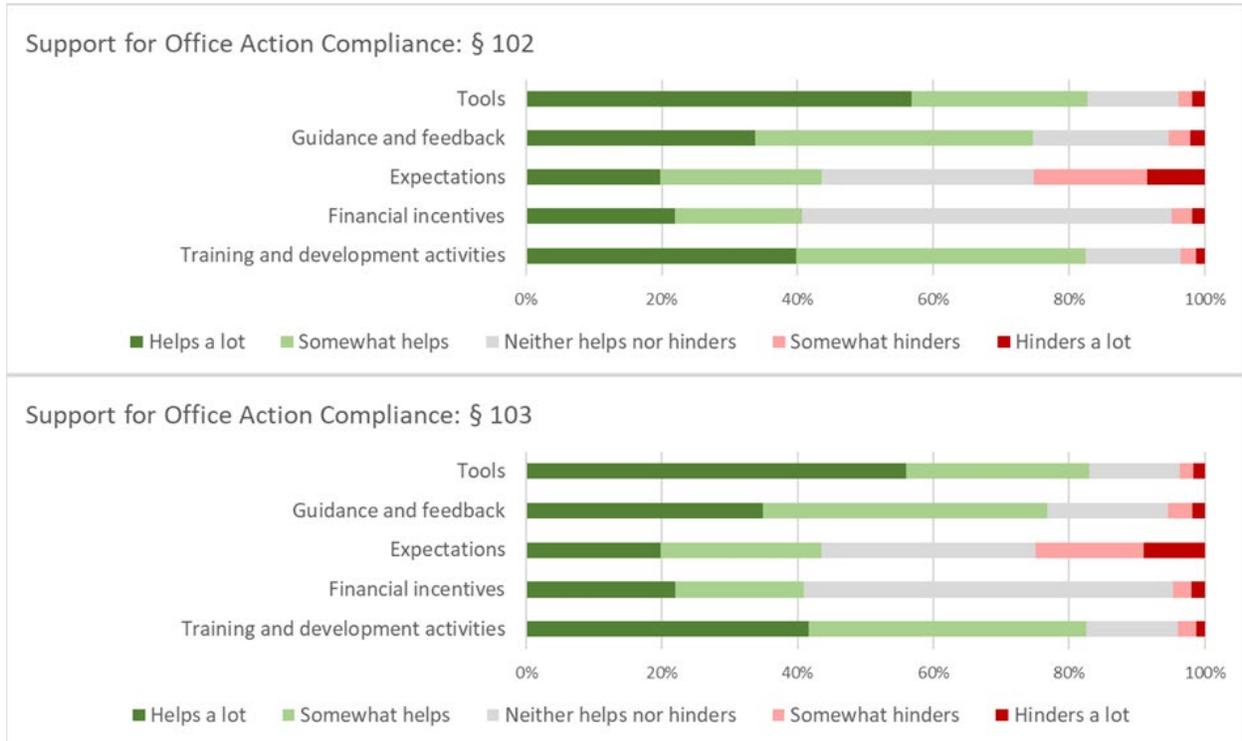


Source: MITRE

D.4.2 Research Question 2: Compliance with Specific Statutes

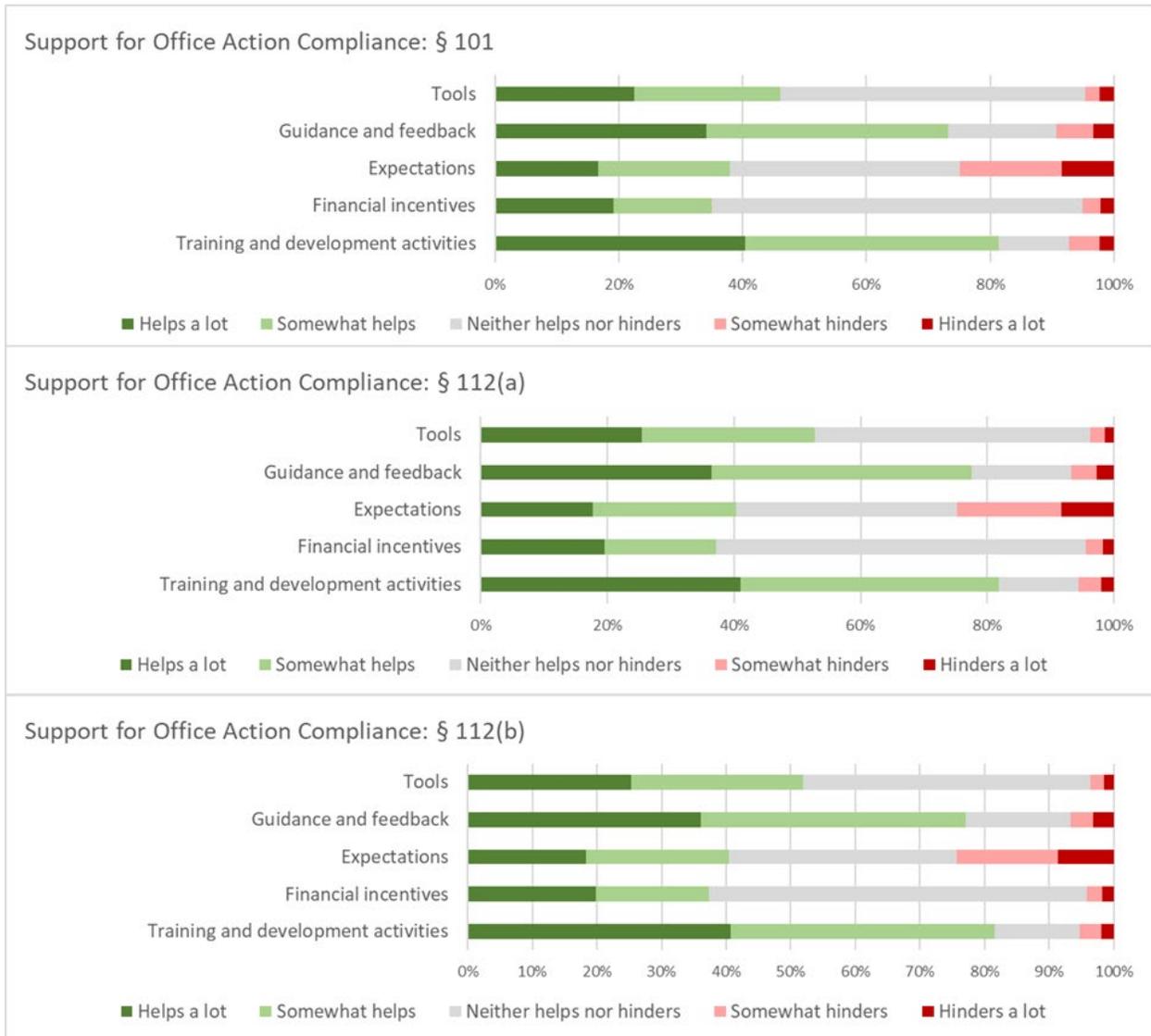
The survey results did not provide strong evidence for many large differences in how well internal controls helped or hindered compliance with *specific* statutes. However, tools were seen as more helpful for §§ 102 and 103 compliance than for §§ 101, 112(a), and 112(b) compliance. A comparison of Figure D-4 and Figure D-5 demonstrates this difference.

Figure D-4. Perception of Controls' Impact on §§ 102 and 103 Compliance



Source: MITRE

Figure D-5. Perception of Controls' Impact on §§ 101, 112(a), and 112(b) Compliance

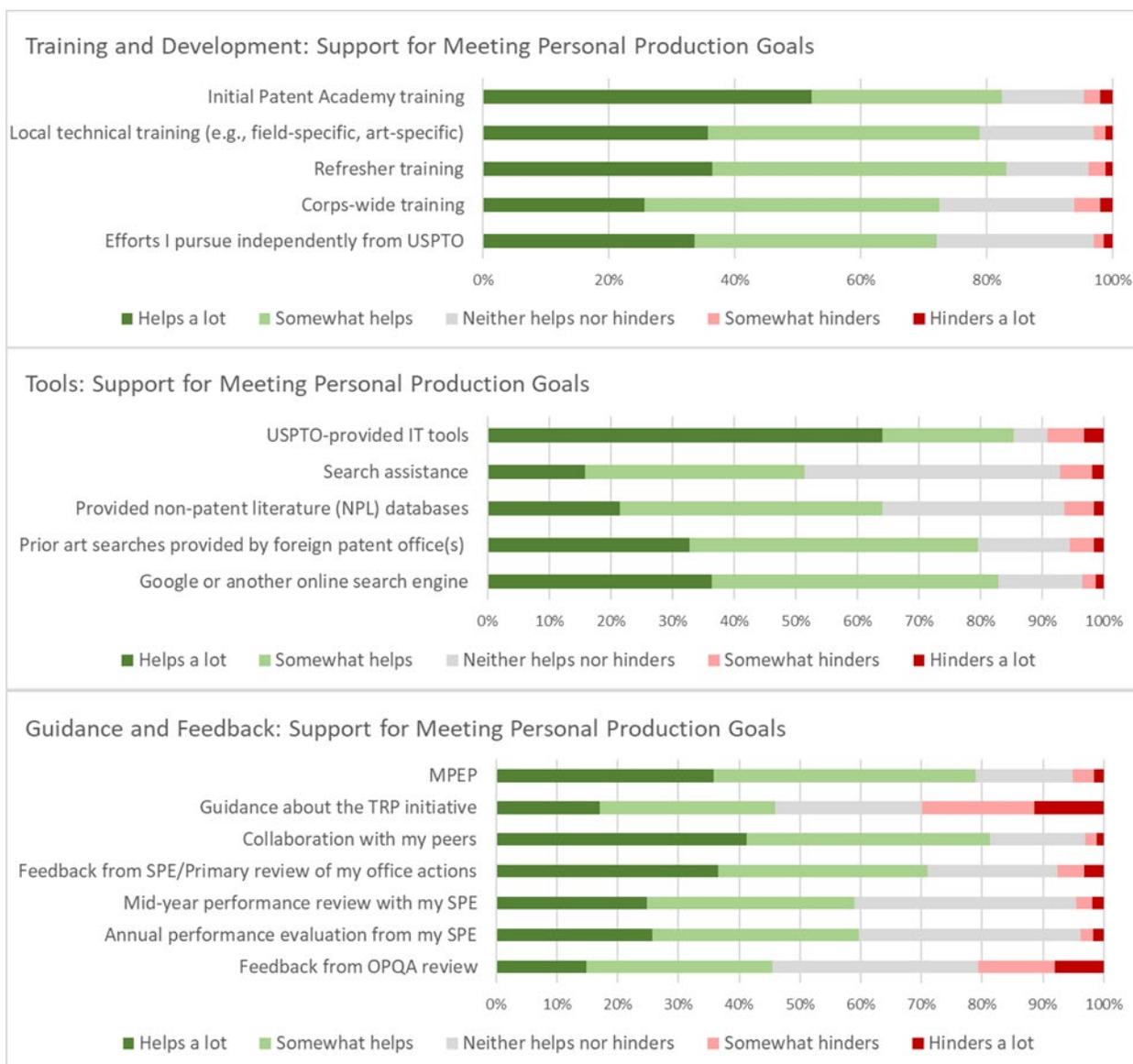


Source: MITRE

D.4.3 Research Question 3: Personal Production Goals

The pattern of responses for personal production goals was nearly identical to the results for compliance. There was only one slight difference between how patent examiners perceived the helpfulness of internal controls toward personal production goals (vs. compliance). Specifically, within the Guidance and Feedback internal control, MPEP and collaboration with peers were among the most favorably rated elements; however, collaboration with peers was rated as somewhat more helpful with meeting personal production goals, and MPEP was rated as somewhat more helpful in issuing compliant Office Actions.

Figure D-6. Controls Perceived as *Helpful* to Meeting Personal Production Goals



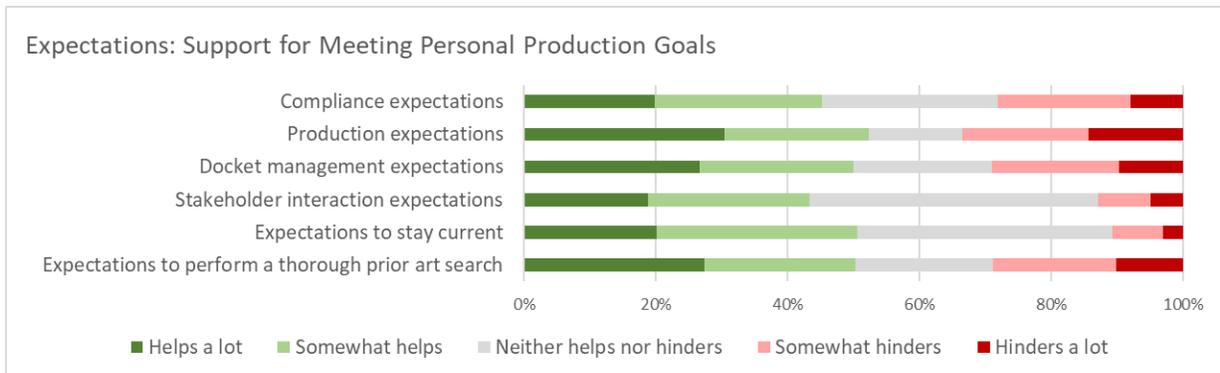
Source: MITRE

Figure D-7. Control Perceived as *Not a Hindrance* to Meeting Personal Production Goals



Source: MITRE

Figure D-8. Expectations Perceived as *Hindering* Meeting Personal Production Goals

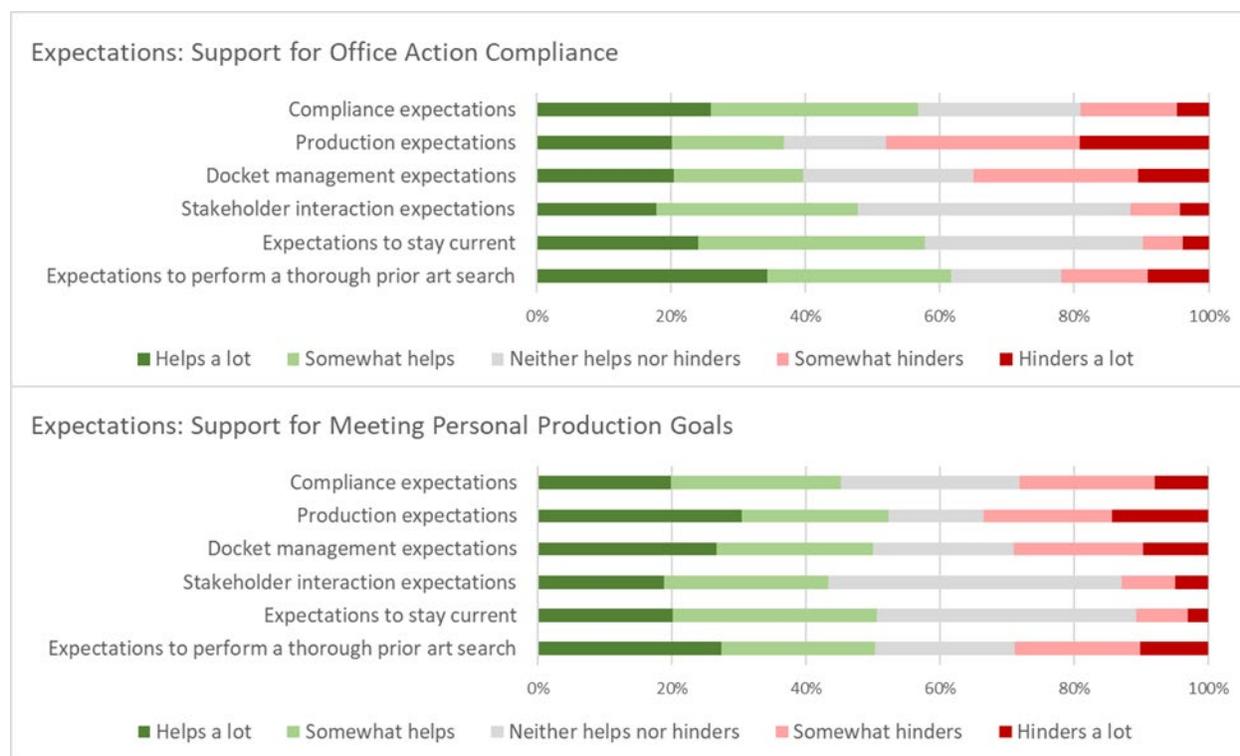


Source: MITRE

D.4.4 Research Question 4: Conflicting Expectations

Performance expectations appear to conflict with one another, as shown in Figure D-9. Specifically, production expectations were viewed as the most hindering of the examiner performance expectations—to both compliance *and* meeting personal production goals. Similarly, docket management, compliance, and prior art search expectations were also viewed as particularly hindering to both compliance and meeting personal production goals.

Figure D-9. Analysis of Potentially Conflicting Expectations



Source: MITRE

D.4.5 Survey Comments

Once we identified the relative strengths and weaknesses among the internal control elements, we analyzed comments made by examiners in the open-ended questions about those internal controls. The results of these qualitative analyses represent potential root causes for the strengths and weaknesses identified in the ratings. The themes we found among the relatively strong internal control elements are shown in Table D3; the themes we found among the relatively weak internal control elements are shown in Table D4.

Table D3. Primary Themes Among Relatively Stronger Control Elements

Internal Control Element	Theme
Training: Initial Patent Academy Training	<ul style="list-style-type: none"> <u>Essential foundation</u>. Initial Patent Academy was generally viewed as an essential foundation to the job, with its helpfulness limited insofar as cases/examples were less abstract and more applicable to the examiner’s future art unit.

Tools: USPTO-provided tools	<ul style="list-style-type: none"> ▪ <u>Useful when they work</u>. USPTO-provided tools are very helpful, but only when they are not accessible, slow or glitchy.
Guidance and Feedback: Collaboration with peers	<ul style="list-style-type: none"> ▪ <u>This most helpful source of feedback is underutilized</u>. Of all the sources of guidance and feedback, colleagues may contribute the most toward an examiner's ability to make quality decisions. However, collaboration does not happen enough because it takes time examiners do not have, is not incentivized, and may be actively discouraged by leadership.
Guidance and Feedback: MPEP	<ul style="list-style-type: none"> ▪ <u>Foundational to the task, but usability is poor</u>. MPEP was perceived as necessary. However, there were complaints about its usability, abstractness, readability/legalese, and contradictory guidance from reviewers.

Source: MITRE

Table D4. Primary Themes Among Relatively Weaker Control Elements

Internal Control Element	Theme
Expectations, <i>particularly</i> : <ul style="list-style-type: none"> ▪ Production ▪ Compliance ▪ Docket Management ▪ Thorough Prior Art Search 	<ul style="list-style-type: none"> ▪ <u>Insufficient time</u>. There is insufficient time allotted to adequately meet all expectations. ▪ <u>Conflicting expectations</u>. Examiners struggle with balancing expectations for high quality, compliance, and thorough examinations while also meeting production and pendency expectations.
Guidance and Feedback: TRP guidance	<ul style="list-style-type: none"> ▪ <u>Too many changes at once</u>. Examiners perceive that TRP involved too many changes all at once. ▪ <u>Increased time pressure</u>. The new TRP is expected to be more time consuming than the old system, even after the transition is completed. ▪ <u>Additional routing duties</u>. CPC routing and C* challenges are seen as detracting from compliant and timely patent application review.
Guidance and Feedback: OPQA feedback	<ul style="list-style-type: none"> ▪ <u>Unhelpful feedback</u>. OPQA feedback is not perceived as helpful in preventing future errors. ▪ <u>Counterproductive method for providing feedback</u>. The manner in which OPQA reviews are conducted and reported back to examiners is seen as counterproductive.

Source: MITRE

Appendix E *Alignment of MITRE and Blue Book Standards*

MITRE conducted this evaluation work according to MITRE standards for the conduct of evaluations and in alignment with the Council of the Inspectors General on Integrity and Efficiency, *Quality Standards for Inspection and Evaluation* (December 2020, Blue Book).⁶⁴ Table E-1 describes the alignment between Blue Book standards and MITRE standards.

Table E-1. Alignment of MITRE and Blue Book Standards

Blue Book Competencies	MITRE Independent Assessment (Evaluation) Standard
<p>Standard 1: Independence</p> <p>This standard ensures that inspectors, inspection organizations, and their reports are impartial and without bias in both fact and appearance.</p>	<p>Working in the public interest requires MITRE to render impartial services that are free of conflict. MITRE maintains strict adherence to the principles of independence—personal, external, and organizational—so that observations, findings, conclusions, and recommendations will be viewed as valid and impartial by knowledgeable third parties.</p>
<p>Standard 2: Competence</p> <p>This standard ensures that the personnel conducting an inspection collectively have the knowledge, skills, abilities, and experience necessary to conduct the inspection.</p>	<p>MITRE carefully selects staff who have the knowledge, skills, abilities, and expertise necessary for the task, including assessment (evaluation) methodologies; technical domain; and the ability to quickly develop a working familiarity with the organizations, programs, activities, and/or functions identified for assessment.</p>
<p>Standard 3: Planning</p> <p>This standard ensures that inspectors give attention to the selection of an inspection’s subject matter and the preparation necessary to conduct each inspection. Adequate planning helps ensure that inspectors appropriately research inspection topics. Planning also helps ensure inspection objectives are clear and adjusted, as appropriate, as the work proceeds. Coordination, research, and work planning should be thorough enough to ensure that inspections will meet inspection objectives.</p>	<p>MITRE follows a disciplined and structured methodology for conducting assessments, beginning with comprehensive planning and preparation that meets well-understood expectations and lays the groundwork for a timely, impactful, and relevant assessment result.</p>
<p>Standard 4: Evidence Collection and Analysis</p> <p>This standard ensures that evidence collected and analyzed is focused on the inspection objectives and supports the findings, conclusions, and recommendations.</p>	<p>MITRE considers data-supported, evidence-based analysis as one of the hallmarks of its work. MITRE’s disciplined quality standards are designed to ensure sufficient evidence is provided such that any reasonably informed person will concur in the findings, conclusions, and recommendations provided.</p>

⁶⁴ Council of the Inspectors General on Integrity and Efficiency, *Quality Standards for Inspection and Evaluation*, 2020, <https://www.ignet.gov/sites/default/files/files/QualityStandardsforInspectionandEvaluation-2020.pdf>.

Blue Book Competencies	MITRE Independent Assessment (Evaluation) Standard
<p>Standard 5: Reporting This standard ensures the clear communication of inspection results to those charged with governance, appropriate officials of the inspected entity, other officials charged with oversight of the inspected entity, and, when appropriate, the general public. Inspection reports present factual data accurately, fairly, and objectively, and present findings, conclusions, and recommendations in a persuasive manner.</p>	<p>MITRE will assure all reported findings are represented factually and fairly and are verifiable by multiple unbiased sources.</p>
<p>Standard 6: Follow-Up This standard ensures that recommendation follow-up is a shared responsibility between the inspection organization and management officials in the inspected entity. Corrective action taken by management is essential to improving the effectiveness and efficiency of government operations.</p>	<p>MITRE considers follow-up an important phase in the lifecycle of an assessment and recommends the sponsoring agent solicit the services of MITRE or any reputable independent organization to conduct follow-on activities that increase the likelihood of successful implementation of assessment recommendations.</p>
<p>Standard 7: Quality Control This standard ensures that inspectors and inspection organizations are following Blue Book standards.</p>	<p>MITRE maintains disciplined internal processes and procedures for ensuring the work performed and the products delivered meet an exceptional quality standard.</p>

Source: CIGIE Blue Book and internal MITRE sources

Appendix F *Acronyms*

Term	Definition
C.F.R.	Code of Federal Regulations
EIC	Electronic Information Centers
FY	Fiscal Year
FMFIA	Federal Managers' Financial Integrity Act
GAO	U.S. Government Accountability Office
IP	Intellectual Property
IT	Information Technology
OPT	Office of Patent Training
OIG	Office of the Inspector General
OPQA	Office of Patent Quality Assurance
PAIP	Patents Artificial Intelligence Prototype
PAR	Performance and Accountability Report
PAP	Performance Appraisal Plan
PE2E	Patents End-to-End
PTA	Patent Term Adjustment
PTAB	Patent Trial and Appeal Board
RQAS	Review Quality Assurance Specialist
SPE	Supervisory Patent Examiner
STIC	Scientific and Technical Information Center
TC	Technical Center
TQAS	Training Quality Assurance Specialist
TRP	Time, Routing, and Performance Appraisal Plan
UCDC	User Centered Design Council
U.S.C.	United States Code
USPTO	U.S. Patent and Trademark Office

Appendix G Agency Response

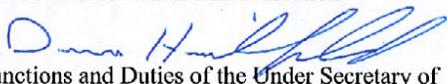


UNITED STATES PATENT AND TRADEMARK OFFICE

UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND
DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

October 18, 2021

MEMORANDUM FOR: Frederick J. Meny Jr.
Assistant Inspector General for Audit and Evaluation

FROM: Andrew Hirshfeld 
Performing the Functions and Duties of the Under Secretary of
Commerce for Intellectual Property and Director of the United States
Patent and Trademark Office

SUBJECT: Response to the Draft Report: "USPTO Has Opportunities to Improve
its Patent Examination Process and to Advance Patent Decision-
Making"

The United States Patent and Trademark Office (USPTO or Agency) accepts the Office of Inspector General's (OIG) recommendations 1-3 and 5-7 and partially accepts recommendation 4, to continue the Agency's efforts to enhance the quality, efficiency, and consistency of patent examination, as well as to increase the transparency of the Agency's progress toward these objectives.

The USPTO appreciates the OIG's recognition that the Agency "examines patents in compliance with applicable statutes, regulations, and case law" (Objectives, Findings, and Recommendations, section 2.1).

The Agency, however, takes exception to the OIG's statement in the report that "USPTO quality review practices may not provide an accurate measure of patent examination quality." While the USPTO recognizes that the phrase "*may* [emphasis added] not provide an accurate measure ..." indicates that inaccuracies do not necessarily exist, the Agency's exception is to the inference of inaccurate measurements. The report does not identify any inaccurate reviews found during the audit work, and the reasons for including the statement are insufficient to infer inaccuracies (see below for further information). As noted in the recent OIG report titled "Top Management and Performance Challenges Facing the Department of Commerce in Fiscal Year 2021," the USPTO "must foster public confidence [in the IP system] in order to promote innovation and economic growth." The Agency is concerned that the inference of inaccuracies may undermine public confidence in our patent system and hinder the USPTO's mission of promoting innovation, when no actual inaccuracies were identified in the audit.

Office of Patent Quality Assurance (OPQA) Reviews

OPQA reviews are highly standardized, thorough, and subject to validation. For example, all OPQA reviews use the Statutory Compliance Master Review Form, a comprehensive

questionnaire that guides the review of the entirety of an office action. Guidance on conducting the review is contained within the form itself, expanded upon in OPQA training materials, and enforced by Quality Leads who supervise the reviewers. The accuracy of OPQA reviews is further validated by a rebuttal process, which allows technology centers to dispute OPQA findings, and by supervisory oversight of the OPQA reviewers, who are accountable in their Performance Appraisal Plans for the accuracy of their reviews.

While the OIG hypothesizes that providing OPQA reviewers less time than patent examiners to conduct a prior art search “may” cause the OPQA to miss omitted references, it has offered no evidence to support this concern. The Agency believes it is reasonable and appropriate to provide an OPQA reviewer less time to review an examiner’s prior art search than the time an examiner is given to conduct an initial search. OPQA reviewers are not meant to examine applications *de novo*; instead, they rely on the full file history, including the search history, to review the examiner’s work. The allotted time allows for targeted searching to fill in any gaps the reviewer perceives in the examiner’s work, and it would be an inefficient use of stakeholder resources to fully re-examine the 12,000 OPQA cases that are reviewed each year.

As the draft report notes, the USPTO’s OPQA compliance targets were set based on past performance. The OIG and/or others may disagree with the Agency’s choice of targets, but the appropriateness of the *targets* in no way affects the accuracy of the *measurement*. Additionally, while the USPTO is pleased that the last two public survey results show that perceptions of quality are at the highest levels since the inception of the survey 15 years ago, the public perceptions of section 101 rejections should not be used to infer potential inaccuracies in reviews of 101 determinations. There can be many reasons for apparent discrepancies between 101 quality review data and customer perceptions of 101 decisions, including that the current jurisprudence on section 101 is not as settled as the other patent statutes.

OIG Recommendations

The OIG recommends that the Under Secretary of Commerce for Intellectual Property and Director of the USPTO:

1. *Direct the Commissioner for Patents to (1) measure the effectiveness of the Office of Patent Quality Assurance (OPQA) process and its targets, and (2) take appropriate action to remedy any shortcomings.*
2. *Direct the Commissioner for Patents to publicly release more of the OPQA review methodology and data to solicit external feedback on the review process.*
3. *Direct the Commissioner for Patents to solicit external stakeholder feedback on responsiveness as an additional performance indicator and to calibrate incentives and expectations.*
4. *Direct the Office of the Chief Information Officer to assess the effectiveness of current tools (e.g., those aiding in performing prior art search and preparation of Office Actions) to help examiners perform more efficiently.*
5. *Direct the Commissioner for Patents to establish regular monitoring of consistency in examination decisions, including trainees’ decisions, by randomly selecting applications for parallel examination.*

6. *Direct the Commissioner for Patents to establish and empower a quality control oversight body to create a comprehensive internal control system consistent with the guidance in the GAO Green Book.*
7. *Direct the Office of Patent Automation to define objective measures of effectiveness for the search tools and training to inform decisions related to prior art search improvements.*

OIG Recommendation 4

Regarding recommendation 4, the USPTO agrees with the suggestion to assess the effectiveness of current examiner tools, but disagrees with assigning this task to the Office of the Chief Information Officer (OCIO). Evaluation of the effectiveness of examining tools will require significant expertise in the examination process and examiner decision-making, and knowledge of patentability requirements. This type of expertise is outside the purview of the OCIO. Accordingly, the USPTO suggests revising the recommendation to: "Direct the Commissioner for Patents to ..." The evaluation may then be conducted by those best able to do so, such as employees in the Office of Patent Information Management, in conjunction with those in other appropriate sections of the Patents organization and the OCIO.