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Evaluation of Patent Examination Pilot Programs

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Evaluation of Patent Examination Pilot Programs

An interactive Qualifying Project
For the USPTO

Submitted to the Faculty of the
WORCESTER POLYTECHNIC INSTITUTE

In Partial Fulfillment of the requirements for the
Degree of Bachelors of Science
By

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Abstract

To properly evaluate two pilot programs developed by the USPTO to expedite the patent application examination process, the team obtained feedback from supervisors of the two pilot programs as well as quantitative and qualitative data on timeliness, quality management and office processes involved. These were compared to that of the standard examination process in order to give the USPTO useful feedback on whether or not the pilot programs are ready to be applied on a larger scale.

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Executive Summary

Service quality and efficiency are essential to the success of an organization. Maximizing both of these aspects will, in turn, maximize the success of the organization. Most organizations have a difficult time figuring out a way to maximize their processes' efficiency and product quality, and once they do develop a method, it takes a great deal of research and data analysis to ensure its effectiveness. There are many applications and guides than can help these organizations achieve maximum efficiency; however not every application will work for every organization. One of the tasks we were assigned was to help the United States Patent and Trademark Office (USPTO) determine which applications would work best. We also evaluated the effectiveness of two of the pilot programs the USPTO has developed and has been utilizing in its Technology Center 2100 (TC 2100), that it hopes will help improve the efficiency of examining patent applications.

In 2007 the USPTO developed a strategic plan, which they will carry out through the year 2012, to help increase their efficiency and the number of patents examined per year and decrease the backlog of applications. Two of the pilot programs that were developed to help achieve this goal, and that we were assigned to evaluate, were the Accelerated Examination and First Action Interview programs. In order to properly evaluate these two pilot programs we first needed to have a basic understanding of the standard patent examination process. We then developed an understanding for evaluation systems that had been used successfully in other organizations. The two methods we based our evaluation and recommendation methods off of were Six Sigma and ISO 9000. These systems help define opportunities for improvement and set standards, respectively.

The methods that we used to evaluate the two pilot programs included meeting with the supervisors of the programs in TC 2100 on a regular basis, mapping out the processes in the pilot programs in great detail, and collecting quantitative data from the pilot programs as well as the standard examination process. By meeting with the patent examination supervisors on a regular basis we were able to have them keep us up to date on the programs as well as tell us what they thought was necessary to improve the programs. It was also important for us to map out the processes so we could have a better understanding of the programs as well as identify if there were any parts of the processes that could be potential problems or might be unnecessary. The collection of data for both the pilot programs as well as the standard process was important because it let us quantitatively compare the processes.

The results that we found for each of the two programs differed because of the differences in the types of data that were available to us. We determined that both programs would definitely save time in the examination process and could help to get rid of some of the patent application backlog, but there is still a significant amount of evaluation and improvement that needs to be done before the programs will be ready to be implemented on a larger scale. For both programs a formal cost-benefit analysis would be useful, in order to see if the USPTO would save money on time and labor if these processes were to be used. There also needs to be a more in-depth quality management evaluation done on the programs to ensure that the patents being allowed by examiners meet the same standards met by the standard examination process. For the Accelerated Examination program it would be beneficial to generate a database that can keep track of all of the AE applications and notify the supervisors and examiners when deadlines are approaching. Something that would benefit the FAI program would be to improve the training of the examiners to better familiarize them with how FAI applications are different from

standard applications and with the different paperwork they need to file. Both of which will help with quality management. If some of these recommendations are completed AE and FAI will be very useful to the USPTO in making the patent review process more efficient.

1.0 Introduction

It is a common goal among all major corporations to maximize the efficiency and quality of their work because with efficiency comes satisfied customers and cost effectiveness. There is always room for improvement. American companies that have already established a successful business continually strive to improve their processes in order to attain an increase in profitability, which is the final result of an increase in efficiency and quality. Examples of companies that have, at one point, looked for a way to improve their processes include DuPont, Dell, and Raytheon. Every branch of the United States Armed Forces has and still does look to improve its efficiency to reduce costs.

The United States Patent and Trademark Office (USPTO) has been in the process of streamlining its processes and office procedures in order to optimize their efficiency. This has become essential due to the large backlog of patent applications. In trying to combat this problem, the USPTO has increased its recruitment of patent examiners and has begun hiring 1,200 new employees per year, which is scheduled to continue through 2012. An increase in the number of employees brings more work for supervisors. As a result of this increase in employees the USPTO will be able to process more patent applications, but this will also lead to more examiners that the supervisors will be responsible for, which in turn could lead to management problems. In order for the USPTO to optimize its efficiency, the directors had to determine which processes were in need of revision and which methods were needed to fix any issues that were identified. By addressing these opportunities for improvement, the USPTO hoped to save themselves a great deal of time and money.

TC 2100 is one of the offices in the USPTO that was looking to improve its processes. It has been implementing two pilot programs, developed by the USPTO, for use on a trial basis.

These two programs are the First Action Interview (FAI) and the Accelerated Examination (AE). The ideal outcome would be that these programs would increase the speed by which patent applications are processed. Two systems developed to improve efficiency are Six Sigma and ISO 9000. Six Sigma is a method for solving both management and organizational problems in a company. It is a systematic approach to define, measure, analyze, improve and control opportunities for improvement that are identified within a process or company as a whole. ISO 9000 is also a system that is used to improve efficiency in companies, but rather than determining what the problem is or what can be done to solve it, ISO 9000 helps to create a set of standards that must be met to increase efficiency in a company.

The two USPTO pilot programs, FAI and AE, have yet to be evaluated and a number of questions remain to be answered about their effectiveness and benefits. For example, USPTO was interested in knowing if the new processes have been more efficient and are meeting the USPTO's quality goals. They are also interested in finding out if the training for the pilot programs has been sufficient for the examiners, how the quality of the programs has been measured, and if the goals of the programs have been consistently met. These topics have been studied superficially, but the USPTO was not satisfied with this analysis. Tracking patents through the review processes and making sure all of the timelines are being met has been difficult for the supervisors, and a better method of organization was needed.

In order to achieve our goal of giving the USPTO useful suggestions on how the AE and FAI programs could be improved so they could potentially be used as an alternative to the current examination process, we set a couple of objectives for our project. First, we identified the FAI and AE processes and determined how they are different from the standard patent examination process. To do this we obtained feedback from supervisors on where they felt the

opportunities for improvement were in the programs and what they thought could be done to make their jobs easier. Along with the quality of the programs, we determined whether the USPTO saved time. Through our analysis of the two pilot programs, AE and FAI, we identified ways to improve these programs that would benefit the USPTO. As a result of our research we believe we have been able to help the USPTO increase its efficiency and productivity.

2.0 Background

This chapter will discuss the background information needed to understand our project. We will explain the patent process, the importance of service quality, and the Six Sigma and ISO 9000 systems used to improve company efficiency and quality. The patent application and examining processes are discussed in section 2.1 in order to give a brief background the operation of the USPTO technology centers. Information about service quality is discussed in section 2.2. Service quality in the USPTO is very important because its income is based solely on the use of its services, which is the examination of patent applications. Six Sigma and ISO 9000 are two management systems that can be applied to an office such as the TC 2100 in the USPTO to improve efficiency. These systems have shown to be effective for a variety of companies with different problems and goals, and we discuss them in sections 2.3 and 2.5, respectively. A case study of Six Sigma deployment in a company is provided in section 2.4 in order to show an example of where and how it can be applied to improve a company's efficiency. In section 2.6 the strategic plan for the USPTO from 2007 to 2012 is discussed, while two of the pilot programs that have been developed to increase the speed of the patent examination process are discussed in section 2.7.

2.1 The Current Patent Process

Before an invention can be patented, the patent must be applied for and examined. There are two different types of patent applications available to inventors, provisional and non-provisional (USPTO, 2008). Provisional applications can be filed first without an oath or declaration, permitting the term "Patent Pending" for the invention. A provisional patent gives the applicant up to 12 months to submit a non-provisional application. If this application is not filed within 12 months, the application will be abandoned. A non-provisional application does

require a declaration or oath, as well as all necessary diagrams and information about the invention. The application is not forwarded to be examined unless this information is present, but once it becomes present, the application will be valid for up to 20 years. Provisional applications are useful for inventors who want to put their invention on the market while acknowledging that they have applied for a patent on the invention. While non-provisional patents do not acknowledge that the patent has been applied for when marketed before it is issued, they are filed and forwarded quicker and provisional applications.

Once non-provisional applications have been deemed complete, they are forwarded to be examined by a patent examiner in a specific technology center related to the technology of the invention (USPTO, 2008). The examination of each application consists of a study of the application in regards to it fulfilling all legal requirements as well as a patent database search to insure that it is not the same as another patent. The examiner must determine that the patent is useful, new and non-obvious. If the examiner decides that the patent meets all of these criteria, the patent is granted. If the examiner decides that the patent does not meet these criteria, the application will be rejected and the applicant will be notified by what is called an "office action". The applicant is now given the opportunity to request reconsideration by pointing out where the examiner's evidence for rejecting the application is wrong. The applicant can also be allowed to make amendments to the invention and application in order to be accepted for granting a patent. Once the examiner deems the patent allowable, the applicant is sent a Notice of Allowability.

2.2 Service Quality

Service quality is an important feature for any business in order to stay in business and not lose all customers (Zeithmal, 1996). Important aspects of service quality include: a short amount of time involved for the service to be performed, strong communication between the

company and the customer, and user friendliness. If a company has good service quality, it will keep all of its customers satisfied and they will keep coming back. At the same time, word will spread about the quality of the company, and more customers will begin using the company's services. If service quality is poor it can ruin a company. Customers do not want a hassle when having a service performed for them, so if they have an option to bring their business elsewhere, where service quality is better, they will. Another thing that is important for service quality is time efficiency, the faster a service is done, the faster a new one can begin. This is especially important to the USPTO.

2.3 Six Sigma

Six Sigma is a way of maximizing the efficiency of a service or process. It was developed by Motorola in order to improve their processes and has become a widespread phenomenon in the business sector (Harry, 2000). Six Sigma forces corporations to scrutinize their procedures step by step. It calls into question every part of the business and looks for ways to improve the necessary parts and replace/remove the unnecessary parts. The main goal of Six Sigma can be argued to be improving processes or quality, but the effect is unquestionable (Eckes, 2001). It increases profitability. It seeks to reduce cost by simplifying processes. It also is used to improve quality of the output of processes. Both of these factors result in a higher profit margin. Six Sigma is not a miracle working process. It requires a great deal of hard work in order to implement such a powerful improvement application. It is up to the company implementing it to decide if it is worth the work to implement Six Sigma into their processes.

Six Sigma seeks to improve processes by reducing factors in these processes that either slow the process down or cause it to be less efficient than it should be (Harry, 2000). These factors are numerous. Imperfections in the final product make the process inefficient and less

cost effective. Wasted time and materials make for a slow and inefficient process, which lowers profitability. Six Sigma not only improves a process by minimizing or eliminating factors that hold a process back, but it also seeks to increase factors that will make the process more profitable once the process is freed from the problems holding it back (Eckes, 2001). By fixing the inefficiencies of the process, there will be an immediate increase in over-all quality of the final product. Once the processes are running with more efficiency, the production rate of the product can be increased (George, 2003). With an increase in both quality and production, there will also be an automatic increase in profit. This is because there will be a greater number of products coming out of the process at a higher standard of quality.

2.3.1 The Six Sigma Process

Six Sigma is a continuous, multi-step process (Diloia, 2006). This means Six Sigma is never really finished. This is why it is important to be sure that the problem(s) that are trying to be resolved call for a Six Sigma approach. Six Sigma is a very intense process improvement method. It may not be needed for all process problems since there are other, simpler tools for fixing small problems within a process. Six Sigma forces companies not only to improve their processes, but after running through the steps once, to continue running through the steps to make sure no more problems arise. These steps in Six Sigma are similar to those used by a scientist when conducting an experiment. They are a set of fundamental steps to solving a problem. They cover all the areas needed to solve a problem and keep it from reoccurring. Fig. 2.1 shows the elements of Six Sigma. The progression of Six Sigma is as follows: Define, Measure, Analyze, Improve, and Control.

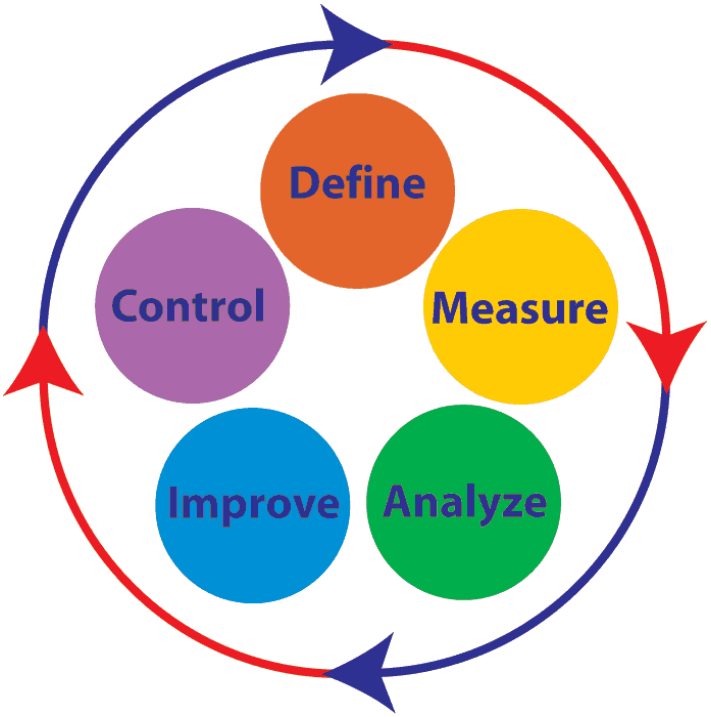

Fig. 2.1: Elements of Six Sigma (Diloia, 2006)

Defining the Problem is the first step of Six Sigma (Diloia, 2006). As with all problem solving methods there has to be an underlying problem that needs solving in order to implement the problem solving tool. This may sound simple, but the problem is not always apparent. To implement the methods of Six Sigma there must be a fundamental understanding of a problem within a process. Once there is an understanding of the problem, then it is possible to go further in-depth with the problem definition. Steven DiIoia, a "Master Black belt" of Six Sigma, puts forth four "key elements" to defining a problem in a Six Sigma Sense:

1. Prioritize opportunities for improvement. What are the issues and their impact within the organization? The impact should be evaluated from different functional areas ranging from financial to strategic goals of the organization.

2. Select the appropriate project based on the data collected in step one and management's acceptance.

3. Create a project charter covering the project statement, project scope, business impact, goals, timeline, project team, and management commitment.

4. Finally, recruit a dedicated cross-functional team comprised of stakeholders to find a solution to the problem."

The first "element" asks the problem solver which areas are most beneficial to improve and to make those areas a priority (Diloia, 2006). For example, if there are several problems with a certain process each one should be looked at from different organizational angles. Two major areas of interest should be cost (how much money can be saved?) and process efficiency (how much will our process be improved). The second asks that a project be selected according to which improvement opportunity will yield the greatest overall improvement in the process. It is always necessary to run the possible project by those who are in charge because they may be looking at the process from a different angle depending on what they believe the priorities of the company are. The third element is, basically, writing up a project proposal. This organizes the main factors in the project in a way that most of the questions management can ask about the project will already be answered in the proposal. The final element is assembling a team. This can be a very difficult job with any project. Members of a project should be skilled in areas necessary for the project, motivated to complete the project, informed on the scope of the project, and dedicated to finding a final solution. Each team member should have different abilities and interests in order to be sure that every skill needed for the project is fulfilled by someone.

The next step in Six Sigma is measurement (Diloia, 2006). The purpose of the measurement step is to collect valid data in order to advance in the problem solving process.

Data are first collected by looking at the big picture or the entire process. The input and output of the process are determined. Once it is seen that there should be a greater output for the given input, the measuring gets more specific. Certain parts of the project have their individual input and output measured (Harry, 2000). This helps to narrow the scope of the problem. It also, most importantly, assures that the definition of the problem is correct. The measurements taken during this step in the problem-solving process give information concerning the cause of the problem. This is where the next step in Six Sigma Problem Solving comes into play.

Analysis is the third step in Six Sigma Problem Solving (Diloia, 2006). This involves taking the data from measurements acquired in the second step and using them to locate and study the cause of the problem. Several techniques can be used in the analysis stage. Depending on what type of problem is being analyzed, some techniques may be more beneficial than others. Graphs and charts are common techniques for displaying every step in a process and the measurements that were taken from it. Several graphical plots may be generated from the measurements. These plots may include but are not limited to output versus time, output versus cost, and cost versus efficiency. After the analysis of the data is complete, action is ready to be taken on the problem.

The fourth step in the problem solving process is Improvement (Diloia, 2006). This means finding a way to minimize the impact of the problem. Ways that this can be accomplished include shifting process times. Different steps in the process require a different individual amount of time in order to be most efficient. To resolve the problem time can be taken away from parts of the process that do not necessarily need as much time to get their part of the job done and given to the part of the process that is producing problems. Another way would be shifting labor. This is generally the same as shifting time except instead of giving the

troublesome part of the process more time; it is given more manpower. These are only a few possible ways that a problem within a process can be fixed. Once the problem has been fixed, it is time to move on to the final step.

The last step in the Six Sigma problem solving process is controlling the improvement (Diloia, 2006). Once the system has been improved, data are taken again to compare against the data recorded from step two. If the process has shown sufficient improvement from when it was declared a problem, then the process is maintained at its current level of productivity and efficiency until another problem can be identified (Harry, 2000). If the process has not shown sufficient improvement, one of two things can happen. If there appears to be no problem with the original data, then the data can be reanalyzed and continued from there. If a there is a flaw found in the data, then the problem solving process should be restarted from the beginning..

2.3.2 Six Sigma Successes

Several companies and organizations have implemented Six Sigma into their processes with great success (Lamprecht, 1993, pp. 4-9). Raytheon's implementation of Six Sigma into its business strategies has led to billion dollar annual savings. Six Sigma has also been doing wonders for General Electric. Just a few years after it was first implemented into the company's processes, profits started growing. After another year the company's efficiency was at an all time high, and the increase in profit doubled. Polaroid Corporation's yearly profit is up six percent since implementing the Six Sigma system. Joseph Kasabula from Polaroid said that Six Sigma succeeded where other process improvement applications failed. He made the point that Six Sigma focuses on improvements that can increase a company's profitability, whereas other applications only focus on quality, which can actually decrease profit (Harry, 2000). The United States Army implemented Six Sigma into its equipment management system in order to

accurately assess the funding needed for support (Six Sigma in the military, 2008). These are only a few of the success stories associated with the implementation of Six Sigma. There are many others who have also reaped the benefits from the hard work they put into implementing Six Sigma.

2.3.3 Example of Six Sigma Deployment

One case study that we found that used the application of Six Sigma was for an unnamed company's Human Resources (HR) department the provided services for 1400 employees in 4 different business divisions for an engineering company that employed over 8000 people globally in 20 different locations. The problem with the HR department at the time was that it did not have a good reputation within the company due to the fact it was seen as reactive, uncoordinated, over-manned and unprofessional, delivering poor, slow and not cost-effective services. The HR employees were becoming demoralized because their efforts were not seen or appreciated. The company decided to implement Six Sigma because it shared the same core values as Human Resource Management does including the values of social and technical systems.

In order to deploy Six Sigma an improvement team was established including: HR process owners, facilitator (Six Sigma Black Belt), a mentor (HR Director) and a group of internal customers who would give feedback on improvements (Wyper, 2000). The primary objective of this team was to develop a program and process that would lead to continuous improvement of the HR in the company, meaning greater customer satisfaction. They did this by using the Six Sigma methods of using fact-based decision-making in their reorganization of the HR process.

The team began their deployment of Six Sigma by prioritizing and determining what was most important in HR (Wyper, 2000). This was determined to be customer satisfaction. Next, the team had to determine how to measure the improvements and what questions needed to be asked and answered in order to implement the Six Sigma ideas. An HR process map was then made in order to determine where in the office the issues were. This map analyzed communication, resources, and development. The weaknesses of the HR department were found and analyzed using this system and in 18 months the cost of HR function per employee had been decreased by 34% .The deployment of Six Sigma on the HR in this company showed that it can be applied to more than just manufacturing and through the proper steps and procedures can increase efficiency and decrease costs drastically.

2.4 ISO 9000

The ISO 9000 series are a set of standards set by the International Organization for Standardization (ISO) that will help a organize a company and increase the quality of its service. The series includes ISO 9000, ISO 9001, and ISO 9004. ISO 9000 is a list of the definitions and terminology of the ISO 9000 series, ISO 9001 is the requirements to become ISO 9000 certified and ISO 9004 is a series of guidelines for meeting the requirements set in ISO 9001 (Praxiom Research Group, 2008). Rochester Institute of Technology's professor and chairman of the graduate statistics department, Edward G. Shilling, (Lamprecht, 1993) says,

> This Series is intended to provide a vehicle to foster interaction of the elements of the modern approach to quality, including statistical applications, quality and reliability engineering, management, and motivational aspects. It is a forum in which the subject matter of these various areas can be brought together to allow for effective integration of appropriate techniques. This will promote the true

> benefit of each, which can be achieved only through their interaction. In this sense, the whole of quality and reliability is greater than the sum of its parts as each element augments the others (p. v).

This view of ISO 9000 shows that it is a way for organizations to develop, implement and improve a system for managing the quality of its product. The system for quality management can be any number of different techniques. This includes Six Sigma (Kaufmann, 2008).

2.5 USPTO Strategic Plan

After reviewing the patent application and examination processes, service quality, the Six Sigma and ISO 9000 management systems, and a case study of how Six Sigma has been deployed on a company, we have determined that in order to propose a solution to increase efficiency in the TC 2100 for the USPTO we need to analyze the office processes. We will need to map out the workings of the office and find what the problem is that is causing the inefficiency in the office. This will be done by interviewing people who work in the office and observing the day-to-day procedures that take place.

The USPTO has a strategic framework. This consists of a mission, vision, set of principles and a set of goals. The mission, vision, and principles help define the duty of the USPTO and the goals are a guide to optimizing the way in which the USPTO performs its duty (USPTO, 2007). The main goal for the patent part of the USPTO is to "Optimize patent quality and timeliness" (USPTO, 2007, p. 14). This means that patents have to be examined on time and correctly. There are three objectives that the USPTO has for the patent process. The first objective is "Provide high quality examination of patent applications" (USPTO, 2007, p. 16). This means each application must be examined in a timely and thorough fashion. The second objective is "Improve and integrate existing electronic systems to promote full electronic patent application

processing; implement better/more secure systems" (USPTO, 2007, p. 17). By setting this objective the USPTO is trying to make patents easier to process by making applications electronic. Instead of having to run around with hard copies of applications, they can be managed electronically. The third objective is "Improve the quality and timeliness of patent examination by exploring a range of approaches to examining applications" (USPTO, 2007, p. 17). This is the objective behind pilot programs which the USPTO uses to introduce new ways of examining patents on a small scale in order to evaluate if they would be beneficial to implement them on a larger scale. The USPTO has ways in which they can measure how they are meeting these objectives and the overall goal of optimal patent quality and timeliness. Here is what they measure:

- Patent allowance compliance rate
- Patent in-process examination compliance rate
- Patent average first action pendency
- Patent average total pendency
- Patent efficiency
- Patent applications filed electronically
- Patent applications managed electronically (USPTO, 2007).

These performance measures cover the major factors that will decide if the USPTO has reached its patent goals. The measures can all be translated into numbers that give a solid representation of what is happening in the patent office. It can show improvements and regressions.

2.6 Pilot Programs

Before the USPTO implements new procedures into the patent process, they often use pilot programs. The pilot programs are utilized on a relatively small scale in order to evaluate the

potential of the new procedure. Two of the recent pilot programs that have been given attention are the Accelerated Examination (AE) pilot program and the First Action Interview (FAI) pilot program.

2.6.1 Accelerated Examination

The Accelerated Examination (AE) program is a pilot program that has been developed and tested by the United States Patent and Trademark Office (Dudas, 2006). This program has been established by the USPTO to speed up the patent examination process. Accelerated Examination is different from the standard patent application processes in multiple ways. One of the most important aspects of the program is that applications that meet the requirements necessary for being approved for the program are almost immediately started in the examination process and do not have to wait in line with standard applications. The requirements for an application to be approved for the AE program are that a prior art search must be completed by the applicant, it must contain less than 3 independent claims (define what make the invention unique), it must be accompanied by correct fees, and the applicant must be willing to have an interview. Applicants must be willing to do an interview with the examiner because it eliminates the amount of back-and-forth communication. Rather than the examiner suggesting corrections to the applicant and the applicant correcting it and sending it back multiple times, all of the problems can be taken care of in one conference. These requirements are necessary because it helps decrease the time required to examine and allow a patent.

Accelerated Examination has a 12 month goal for completing the examination that every application is supposed to meet (Dudas, 2006). This means that from the time the application is submitter to the time a final decision is made, it should take no more than 12 months. A major factor in meeting this goal is the time restriction on applicant replies to office actions. The AE

process is strict about the applicant replying to any office action within one month, with no extensions. This is different from the regular examination process because the reply periods can be extended up to 3 months. The USPTO has been utilizing this process with voluntary applicants, and it looks to one day utilize many of the parts from the program in the standard examination process.

2.6.2 First Action Interview

The AE pilot program was the basis for another program called the FAI program. This program gives the applicant a chance to prepare for an interview with the examiner in order to clear up any misunderstanding the examiner may have about the application (Focarino, 2008). During the standard procedure for patent examination that examiner would send office actions to the applicant, and the applicant would send amendments to the application back to the examiner. This caused small amounts of information to go back and forth between the examiner and the applicant over a long period of time. With the interview, the information is all presented at once to clear up any misconceptions about the application in a few hours rather than several months.

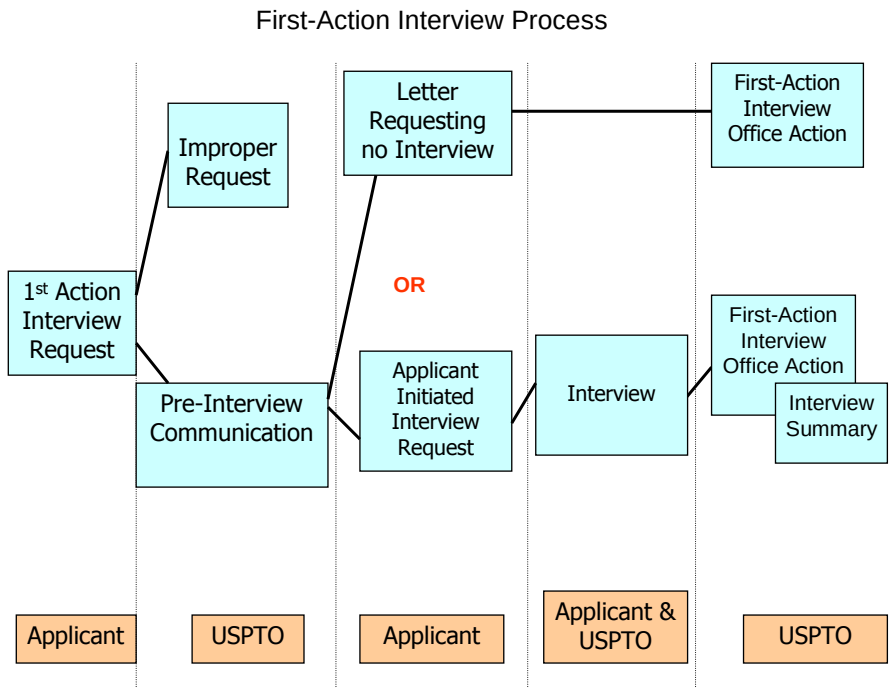

Fig. 2.2: First-Action Interview Process (Focarino, 2008)

Fig. 2.2 shows the chain of events in the first action interview program. The applicant must first request to have an interview with the examiner (Focarino, 2008). If the request is proper, meaning that the application requirements have been fulfilled, the examiner will search the claims of the application as in the standard process. The examiner will then proceed to fill out pre-interview communication which tells the applicant about any objections or rejections the examiners has for the application. This gives the applicant a chance to prepare to clear up any misunderstandings, if any, about the application. Once the interview is conducted and everything is sorted out between the examiner and the applicant, the examiner will send out a first office action as he/she would in the standard patent process. The goal of the interview is to minimize the number of office actions after the first office action.

This chapter has presented all the necessary research that we needed to move to the next step of our project: developing a detailed methodology. Using the information in this literature

review we were able to decide what type of methods we should use for a Six Sigma style analysis of the Accelerated Examination pilot program First Action Interview pilot programs.

3.0 Methodology

The goal of this project was to evaluate the speed and efficiency of the patent application examination process in the Unites States Patent and Trademark Office's Technology Center 2100 (TC 2100). The background research we have done has provided us with knowledge about the processes in the office. We also researched systems that can be applied to an office similar to the USPTO that can improve its efficiency, such as Six Sigma and ISO 9000. Our background research also discussed the logistics behind a couple of different pilot programs, Accelerated Examination and First Action Interview, that Tech Center 2100 has been testing and could be used more widely to improve the speed and efficiency of TC 2100's patent review process. One of the major issues that TC 2100 faces is a two-and-one-half year backlog of patent applications, from the time an application is submitted until the examination starts. In order to achieve our goal we identify forth our objectives. Our objectives were to: identify problems with the pilot processes based on information given to us by supervisory examiners and technology support specialists, measure the impact of the problems by collecting data on the processes through existing examiner survey results and analyze the measurements in order to find possible solutions to the problems. The methods we used to complete our objectives and achieve our goal were based off the Six Sigma problem-solving program and are described throughout this chapter.

3.1 Assessment of the TC 2100 Office Procedures and Pilot Programs

In order to assess the TC 2100 office procedures, we first studied how the TC 2100 office is structured. Then we learned the steps that are taken by patent examiners when examining a patent application to find how these steps differ from those in the pilot programs we reviewed. This was the first step of the Six Sigma process because it helped us understand the definition of

the problem. The methods we used in this step were mapping out the current patent application examination process, as well as mapping out the pilot examination processes, interviewing employees in the office, supervisory patent examiners (SPE's), and determining how long certain parts of the application examination process take. Through a thorough analysis of TC 2100's patent examination procedures, we were able to propose a way of establishing a Six Sigma type system of continuous improvement that could be implemented in TC 2100.

3.1.1 Existing Flow of Information and Communication

In order to be able to compare the pilots that we looked at to the current application process, we had to go beyond mapping out the standard chain of events in the typical patent process and understand the details of each step in the process. We did this by reviewing the Manual of Patent Examination Procedure. We came to understand the chapters of the Manual that outlined the ideal patent process in detail. This information enabled us to map out the ideal way the patent process works in greater detail. Since the pilot processes deal with only certain parts of the examination process, it was important to understand the parts of the process they were meant to improve thoroughly.

In order to get even more specific with our map of the current process we factored in the indicators that measure the efficiency of the current process. These indicators included the allowances of cases vs. rejections, average number of officer actions per case, and error rate which measures the quality of allowed applications.

3.1.2 Flow of information and Communication in Pilot Programs

We mapped out the flow of communication and information in the USPTO's pilot programs. These programs are the Accelerated Examination and the First Action Interview

Programs. We had to research the programs and map them out in the same way we did with the standard application examination process. Using the data collected from a review of these pilot programs and an interview with the each of the SPE's assigned to oversee the pilot programs, we were able to compare and contrast the standard patent process and the pilot programs.

3.1.3 Interviewing and Surveying Employees in TC 2100

We interviewed employees in the TC 2100 in order to better understand the standard and pilot processes. We conducted an informal interview with the SPE's who were the overseers of the pilot programs when they were being implemented and discussed what they found to be the strengths and weaknesses of each pilot program. We conducted these interviews in order to help us get a better idea of the purpose of the programs and how they were supposed to make a difference in the speed and efficiency of the patent examination process. We also informally interviewed the SPE's who oversee the current patent application process and found out what they feel are some things that slow down the examination process, as well as what they feel is essential and can not be changed.

We received statistical data from the supervisors of the pilot prams as well. These data included allowance rates, actions per disposal, average time spent examining an application, average life of an application, and quality of prior art searches. These statistics were what we needed to perform a quantitative analysis of the pilot processes.

3.2 Data Collection and organization

Once we had collected the data from the different processes and programs in TC 2100, using the process maps, statistics, man hours, and interviews, we organized them into quantitative data and qualitative data. This step was similar to that of the second step of the Six Sigma program.

The information from the interviews was put into the qualitative side of our data since that deals with the views of the supervisors. The flow of communication and information through the different programs was mapped out and organized in usable flow charts. The statistics, such as error rate and average time that the part takes, were tagged onto their respective parts of the process. It made it easier for us to analyze our data by organizing it in this way.

Statistical data were put into charts and tables in order to aid in visual analysis. Using these figures made it easy to pick out discrepancies, inefficiencies, and other problems with the processes.

3.3 Analysis of Data

` We analyzed our data according to the third step of the Six Sigma process. We used the data collected from the interviews to create a chart that was broken up into the positives and the negatives of each program/process. In doing this we were able to determine what parts of the process were absolutely necessary and what were not needed and could be removed. We also used our flow charts of each process to compare the pilot programs to the current examination process and see if they were faster, less expensive and more efficient than the standard processes. This analysis helped us to see if and how the pilot programs were more efficient than the current examination process, and how adjustments could be made to the standard process to make it faster, more efficient, and less expensive.

This gives a brief summary of what methods we used in order to measure and analyze the new pilot processes within TC 2100. These methods provided us with the information we needed to generate a clear set of results aimed at finding advantages, and areas of improvement within the pilot programs. This included finding areas where more data must be collected and recommendations on how to meet the ISO 9000 Standard

4.0 Results and Analysis

The data we obtained on the AE and FAI processes, both qualitative and quantitative, were a compilation of data that had already been collected by the USPTO, as well as feedback from the supervisors of these programs. There were different amounts and types of data available for each of the procedures, which is why our results vary. In order to keep these results organized in a meaningful manner we used the Six Sigma system as a framework. We used the first three steps of this system to define, measure, and analyze the results that we found. By doing this we were able to make useful conclusions and suggestions on how to take advantage of the opportunities for improvement that we had identified. This chapter is organized into sections that contain the results and analysis of the standard patent examination process, AE, and FAI, respectively. For the standard examination process, because it is the process used throughout the USPTO, there were data available that were comparable to what we collected for each pilot program. For the AE process we reported results on the organization of the process, quality management and allowance rates for applications. The FAI section contains results on the procedure, training, and feedback from examiners and applicants. The reason the data collected for the two are different is because there were limited data available for each program.

4.1. Standard Examination Process

Before we could derive conclusions from the analyses we made of the AE and FAI programs, it was necessary for us to compare them to the standard examination process. In order to do this we had to collect data on the standard process, specifically in TC 2100 (except for when compared to some AE data), that could be compared with the different sets of data we obtained for AE and FAI. The data collected and analyzed to be compared with the pilot programs were the average number of months pending to disposal over the past fiscal year, the

average number of months until a notice of allowance and the percent allowed of disposals. The number of months pending to disposal mean the number of months from the time that the application was filed with the USPTO until the final action is made, whether the applications is completely abandoned or when the patent is written up and granted to the applicant. The number of months until a notice of allowance as similar to time until disposal, but it is until the applicant is notified that the application is allowable to become a patent, even though it has not been written up yet. Percent allowed of disposals simply means the number of patents allowed per disposals, or final actions made.

4.1.1 Patent Disposal Data

One of the major issues in the entire USPTO is that the patent application process takes long time relative to the goals set by congress. This is an issue for applicants because from the time they submit their patent application it can take over three years for them to be notified if the application is allowed, and after that they still have to wait for the patent to be issued. Two graphs, Fig. 4.1 and Fig. 4.2, show the average number of months for some of the disposals to take place. Fig. 4.1 shows the average number of months from when a patent application is submitted to when the applicant is sent a notice of allowability. Fig. 4.2 shows the average number of months that it took for the disposal, whether the patent was issued or abandoned, from when the application was filed.

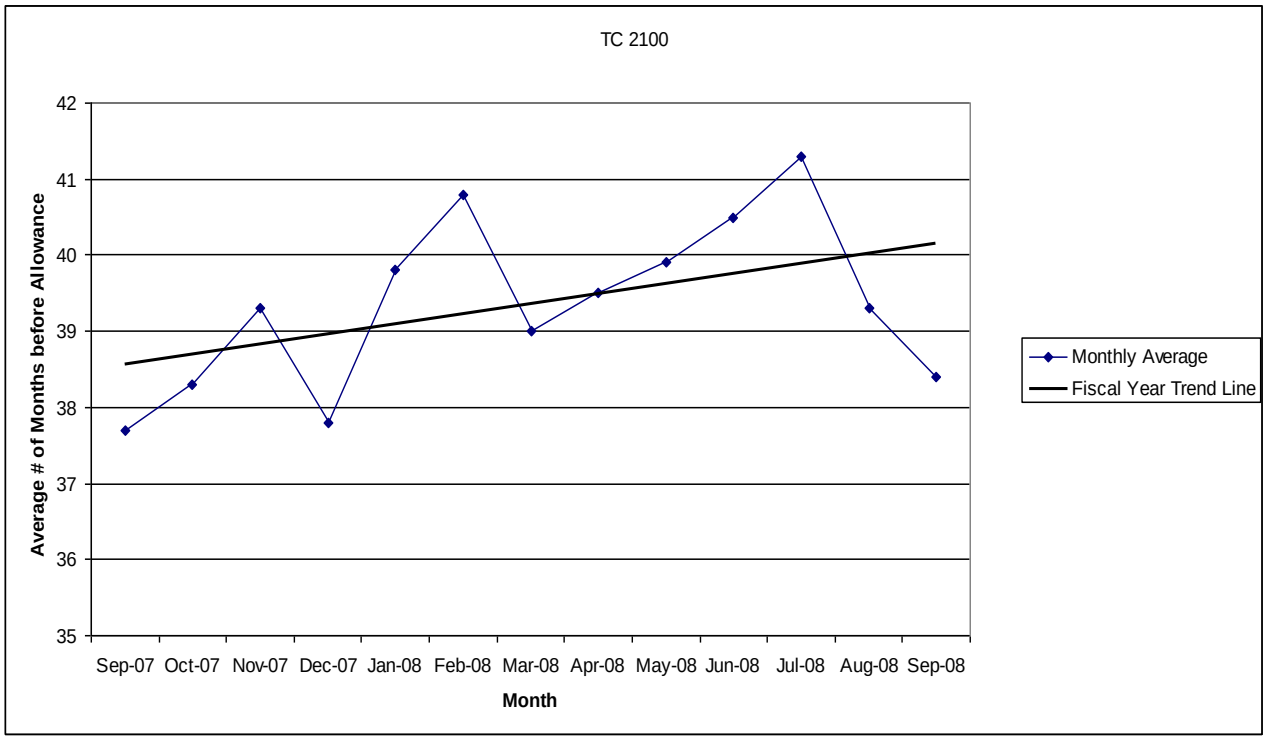

Fig 4.1: Average Number of Months from Filing Date to Notice of Allowance in TC 2100

(data provided by an internal USPTO source)

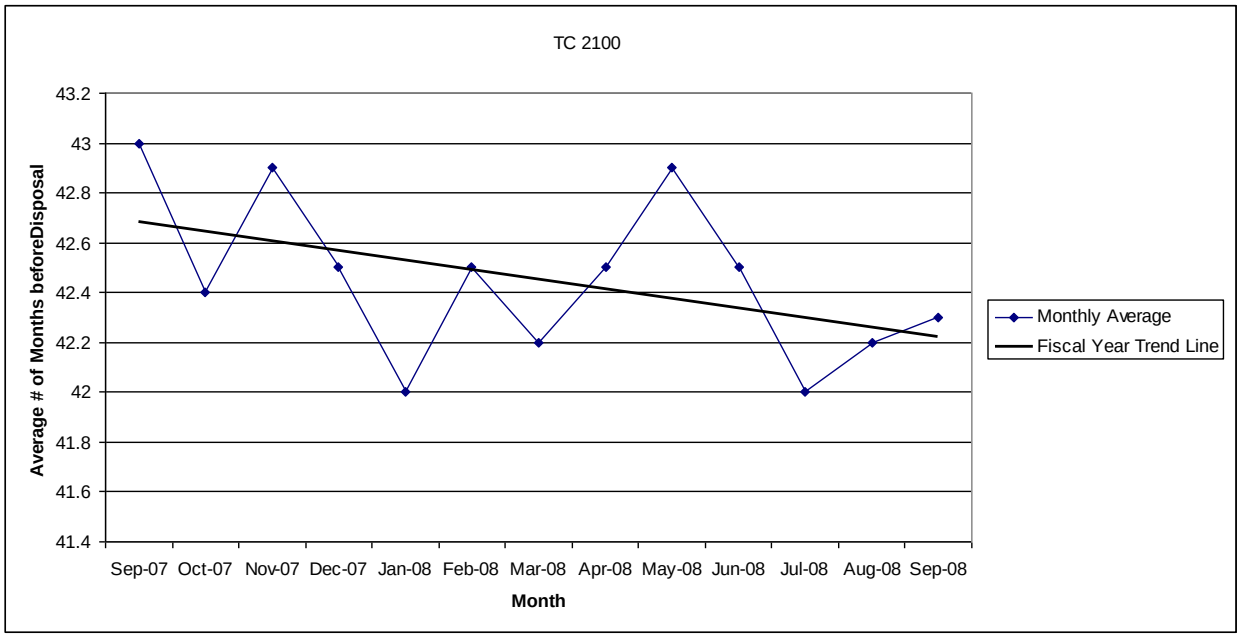

Fig. 4.2: Average Number of Months from Filing Date to Issue of Patent or Abandonment

(Data provided by an internal USPTO source)

As can be seen from these figures, the patents that were allowed over the past fiscal year were patents that were filed 3 to 3 ½ years previous. There is also no sign of improvement on getting rid of the backlog because the fiscal year trend line increased meaning the patents being allowed had been pending for longer time as the year progressed.

An important statistic when comparing the standard examination process with the pilot programs is the percentage of applications allowed per disposals. This is important because it is beneficial to both the USPTO and the applicants to have patents issued. Fig. 4.3 shows a graph comparing the percent of applications allowed per disposal in TC 2100 over the past fiscal year.

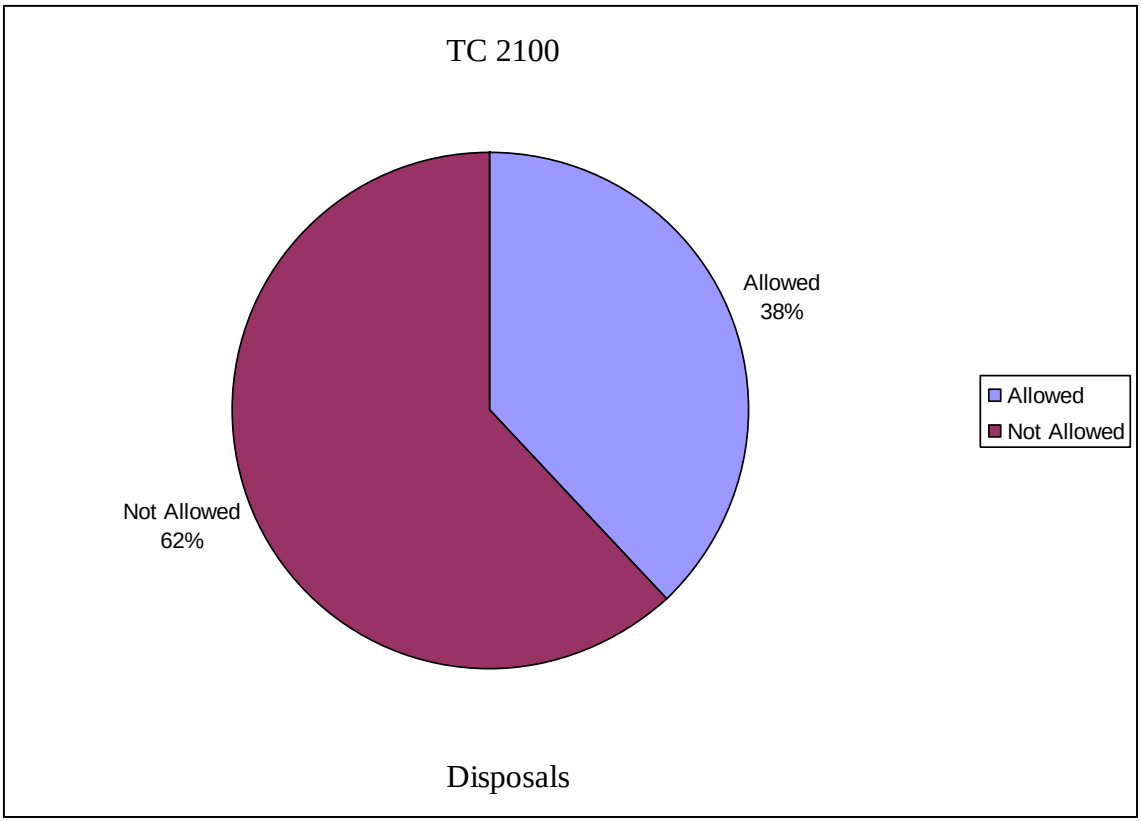

Fig 4.3: Allowance Rate per Disposal in TC 2100 (data provided by an internal USPTO source)

Other important statistics in the standard process include, hours per first action, hours per disposal and actions per disposal. These numbers were all found in the biweekly technology center time and activity report for TC 2100 for the biweek ending on September 30th 2008. The average number of hours per first action in TC 2100 was found to be 28.2. This means that an examiner in this workgroup spends, on average, 28.2 hours on an application before sending out a first office action. The average number of hours per disposal was found to be 30.6. This means that the average time an examiner spends on an application from when they first pick it up until the final office action (rejection, allowance, or abandoned by applicant) is 30.6 hours. The average number of office actions per disposal was found to be 3.0. This means that the average application takes about 3 office actions until it is disposed of.

4.2 Accelerated Examination

In order to properly gather data from the Accelerated Examination process we first needed to understand the AE process. This was done by mapping out the process in detail as well as by identifying who in the office is involved in what procedures. The detailed maps of this process can be seen in Appendices B-C, a condensed version is shown in Fig. 4.4. The flow chart in Fig. 4.4 shows each step of the AE process as well as what week after filing the step of the process is expected to be completed by. After reviewing the AE process we found a few main issues needed to be addressed before the process could be deployed throughout the USPTO. These issues included the organization of the process, the quality management analysis that had been done on the process, and the rate of allowances per disposal.

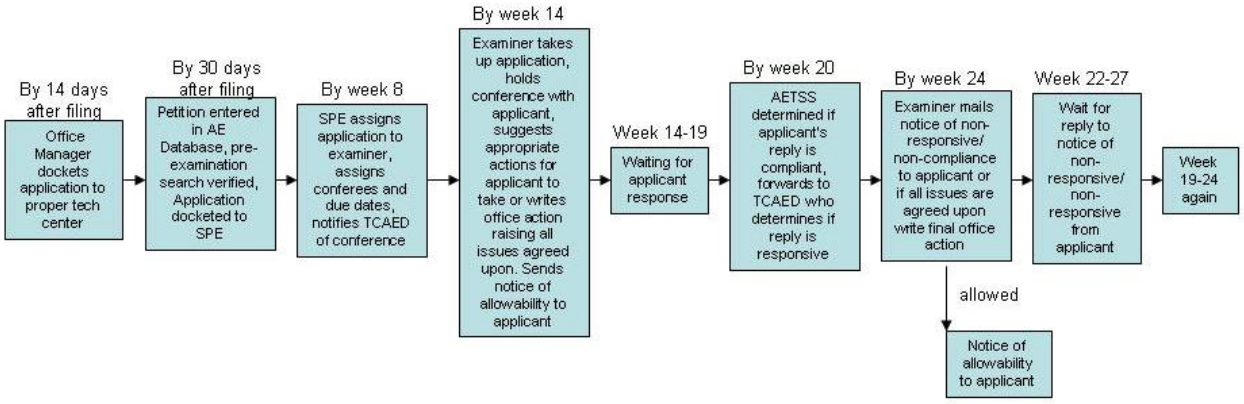

Fig. 4.4: The condensed overview of the Accelerated Examination process

4.2.1 Timeliness of Process

As can be seen in Fig. 4.4 the process has a quick timeline, compared to the standard examination process, and if corrections are made after the first conference between the applicant and the examiner, the USPTO can notify the applicant if the patent is allowed within 24 weeks (6 months). The average number of days it took from the filing date to the date of allowance, over the past fiscal year, was 192 (about 6 ½ months), while the average in the standard examination process is 39.4 months. Fig 4.5 shows the average difference in time between the standard process, in TC 2100, and the AE process, for the entire USPTO, from when an application is filed until a notice of allowance is sent to the applicant. Fig. 4.6 shows a comparison in the average time from when a first action is made by an examiner to when a notice of allowance is sent out. This is useful because it eliminates the fact that AE applications begin the examination

process almost immediately after filing while standard applications have an average of a 30.8 month backlog in TC 2100 before the examination begins.

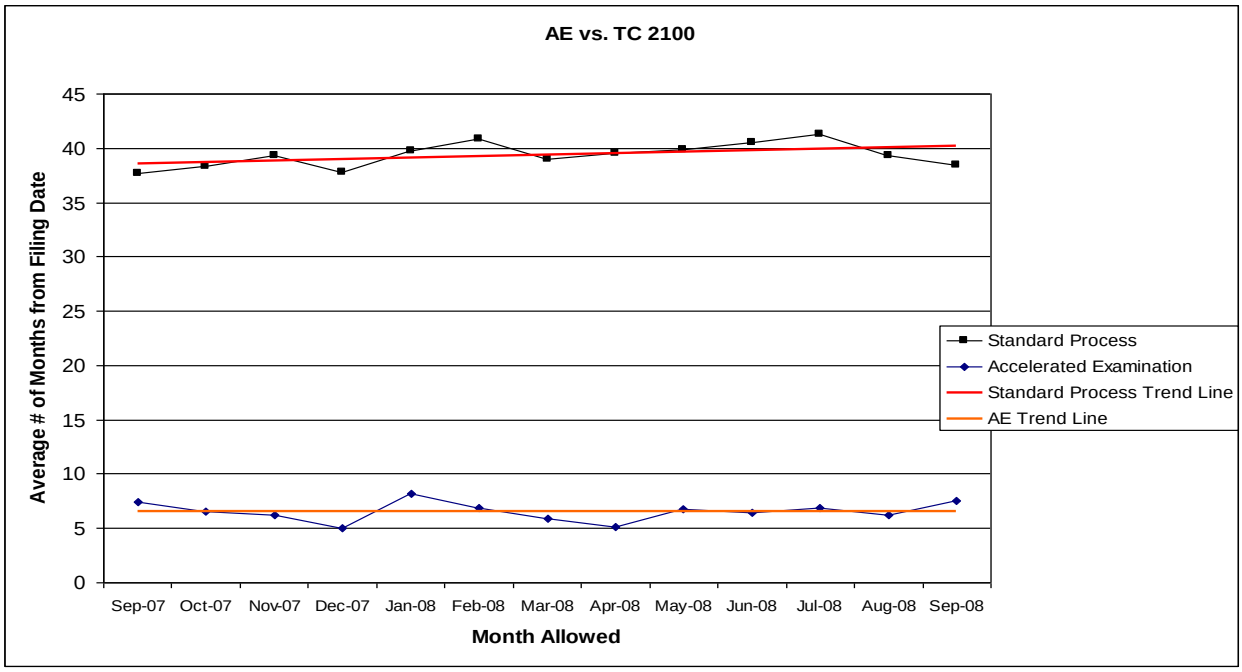

Fig. 4.5: Comparison between AE and TC 2100 – Filing Date to Notice of Allowance (data provided by an internal USPTO source)

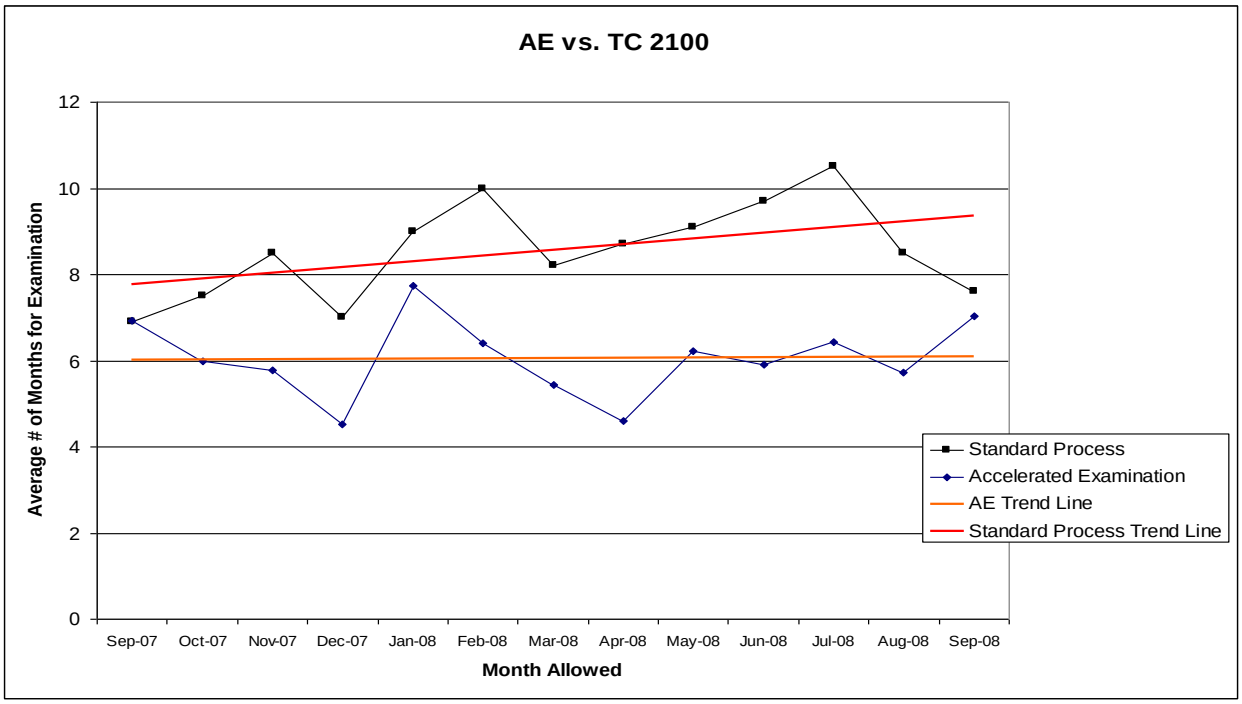

Fig 4.6: Comparison between AE and TC 2100 – First Action to Notice of allowance (data provided by and internal USPTO source)

As can be seen in Fig 4.6, even though the backlog of applications for the standard process adds 30.8 months to the amount of time it takes for a patent to be allowed, the AE process was still up to three months faster, from the first office action, over the last fiscal year.

4.2.2 Organization of Process

One potential opportunity to improve with the organization of the accelerated examination process is that there is currently no concrete method of tracking applications throughout the examination process and making sure all deadlines are met.

We asked the TC Accelerated Examination Designee (TCAED) for TC 2100 for her perspective on the AE process. She indicated to us what she felt the issues were for the program from an administrative perspective. She indicated that the most difficult thing for her is managing all of the patent applications and making sure all of the deadlines are being met at all

times. She also indicated that occasionally an application for the AE process will arrive, but due to the large number of applications examined it "gets lost" and is not examined. This is a problem that has an effect on both the TC and on the applicant. The TC is affected by this because it not only reflects poorly on the TC as a whole if applications are not being properly examined, but also once the application is found to be behind schedule, it must be attended to immediately which can make more work for the examiners in the TC. Applicants are especially affected when their applications are not processed in the timely manner that they expect, because when they do the extra work to have their application meet AE specifications, they expect it to be processed immediately, just as an AE patent application should be.

From the information received from the TCAED about the difficulty of ensuring all applications meet their deadlines, it is clear that a system for organizing and thoroughly tracking the applications is needed. If a computer program that can track applications and notify the TCAED when a deadline is approaching were developed, it would help the TCAED give attention to applications that are not on track, rather than the applications that are meeting all of their deadlines.

4.2.3 Quality Management and Analysis

In order to be able to determine if the AE process provides as thorough an examination of patent application as the standard examination process, there needs to be an analysis of the quality of allowed patents.

Quality analysis of the process is done by reviewing the patents for errors and has been done for a statistically significant number of patents that have been examined through the standard examination process. However, there has not been as thorough of data collected from

patents allowed by the AE process. The only quality management data currently available from the AE process is IPR-compliance rates as shown in table 4.1.

Table 4.1: Accelerated Examination IPR-Compliance Rates allowance (data provided by and internal USPTO source)

Review Finding – Only Closed Cases				
		Deficiency	**Compliance**	
TC	**Count**	**Row N %**	**Count**	**Row N %**
1700	0	0%	1	100%
2100	0	0%	7	100%
2600	0	0%	1	100%
2800	0	0%	3	100%
3700	0	0%	2	100%
Total	0	0%	14	100%

An IPR-compliance, in process review compliance, means that an application was rejected for the right reasons, and as can be seen in table 4.1 all 14 AE cases that were reviewed were 100% correct and is above the USPTO's current goal of 92.5%. Having 14 cases that have been reviewed is not a statistically significant set of data though. If TC 2100 wants to be able to thoroughly compare the quality of the AE process to the standard examination process, there needs to be more quality management data collected. Without such data, it is difficult to tell if the AE process produces work meets the goals set by the USPTO, or if the applications contain more or fewer errors due to the speed of the examination process.

4.2.4 Allowance per Disposal Rates

The status of the patent applications in the AE process is important to know because it helps us see the outcomes of the applications (whether they are granted or denied. These data allow us to look at the final decisions that have been made and allow us to compare the number of patents granted to those that were either dismissed or abandoned. Fig 4.7 shows the results of the final actions given (Granted vs. Denied). The granted applications make up 70% of final actions made. This number of allowed patents is 32% greater than those of the standard process shown in Fig. 4.3.

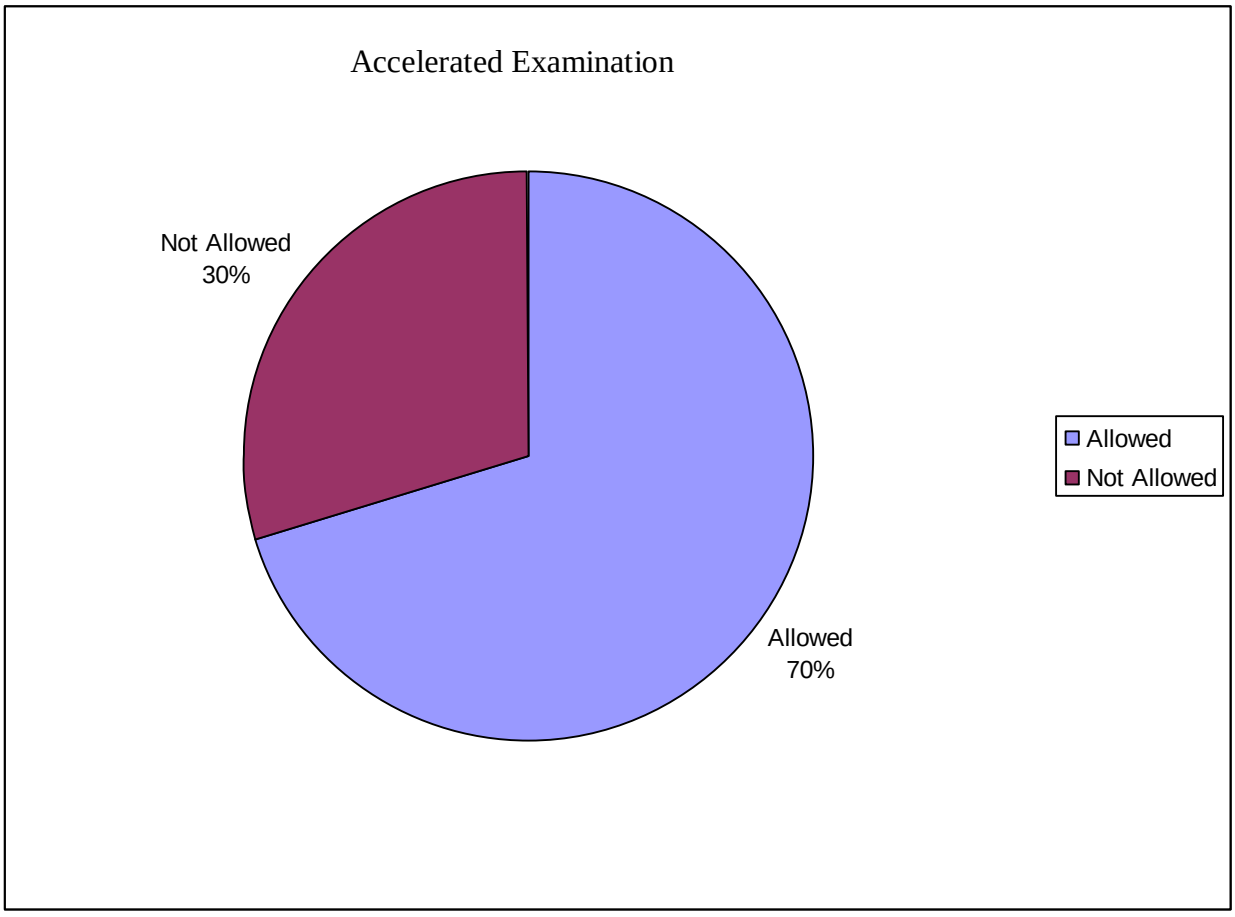

Fig. 4.7: Allowance Rate per Disposal for AE in TC 2100 as of Oct. 16, 2008 allowance (data provided by and internal USPTO source)

4.3 First Action Interview (FAI)

Our first course of action concerning the FAI pilot program was to understand the standard flow of information during the process. In order to apply Six Sigma to the process we had to identify possible points of inefficiency in the process. Fortunately, the process had already been mapped out in a very detailed flow chart. Figure 4.8 is a simplified form of the flow chart.

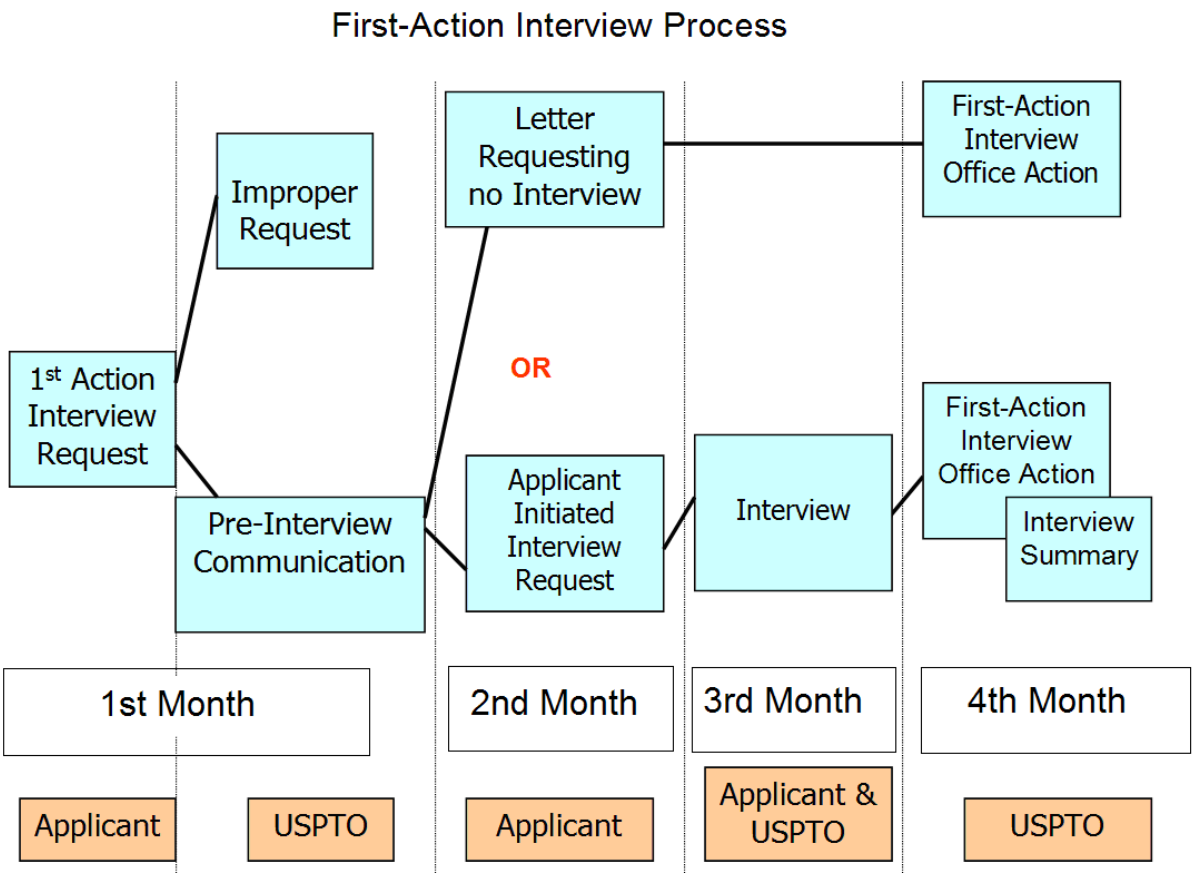

Fig. 4.8: Simplified FAI Flowchart with timeline (Forcarino 2008).

The first impression that we got from this flow chart was that the process looked very efficient. There was not a great deal of repetition of tasks, time requirements seemed reasonable, and there were stages that required examiners to create records of their work. On paper, the process seems to be very efficient; however, as is common with most processes, how the process looks on paper

differs from how it is carried out in reality. This was the basis for our Six Sigma analysis of the process. The following opportunities for improvements in the process were found by looking at the discrepancies between how the process is supposed to work and how it actually works.

There were only a few opportunities for improvement found in our Six Sigma analysis of the FAI pilot process. This was expected as the supervisory patent examiner in charge of overseeing the FAI pilot program, indicated that the FAI pilot program was running smoothly from her supervisory perspective. She did not expect us to find many major flaws in the process but advised us to consult other supervisors overseeing the FAI pilot program such as a supervisory patent examiner in charge of keeping statistics on the FAI pilot process. Based on information and statistics we received from the TC statistics lead we were able to perform a Six Sigma analysis of each of the opportunities for improvements. These opportunities for improvement were related to procedures, examiner training and comparing FAI to the standard examination process.

4.3.1 Procedure

Define

One of the first opportunities for improvement was brought to our attention by the statistics lead who informed us that examiners had not been following proper procedures while processing an FAI application. The TC statistics lead indicated that there is a set procedure and a checklist of all the tasks that examiners are supposed to complete while processing an FAI application, but examiners were either skipping steps or getting sidetracked due to confusion about the process. More specifically, many examiners were not completing summaries of prior art searches, which give general information concerning the search and search strategies in order to ensure that a sufficient search was conducted.

Measure

Data were collected from twenty-nine FAI cases by the Office of Patent Quality Assurance (OPQA). Here is an excerpt from their report:

> The biggest issue that stands out is a lack of recordation of the search and search strategies. Almost half (14 of the 29) didn't include an adequate record of what was done. That skewed the results of the questions regarding whether appropriate areas were searched (55% No), whether the search strategy was adequate (52% No) and whether it appears a complete search was performed consistent with what is set forth in MPEP 904 (66% No). (Office of Patent Quality Review, 2008)

The OPQA indicated the lack of adequate search summaries caused flaws in the overall quality of data shown in Figure 4.9. In addition, The TC statistics lead indicated that examiners have also been failing to turn in summaries of the interviews with the applicants. The OPQA believes that the quality of the work is comparable to that of the standard application process however the lack of search recordation makes it difficult to perform an accurate quality assessment.

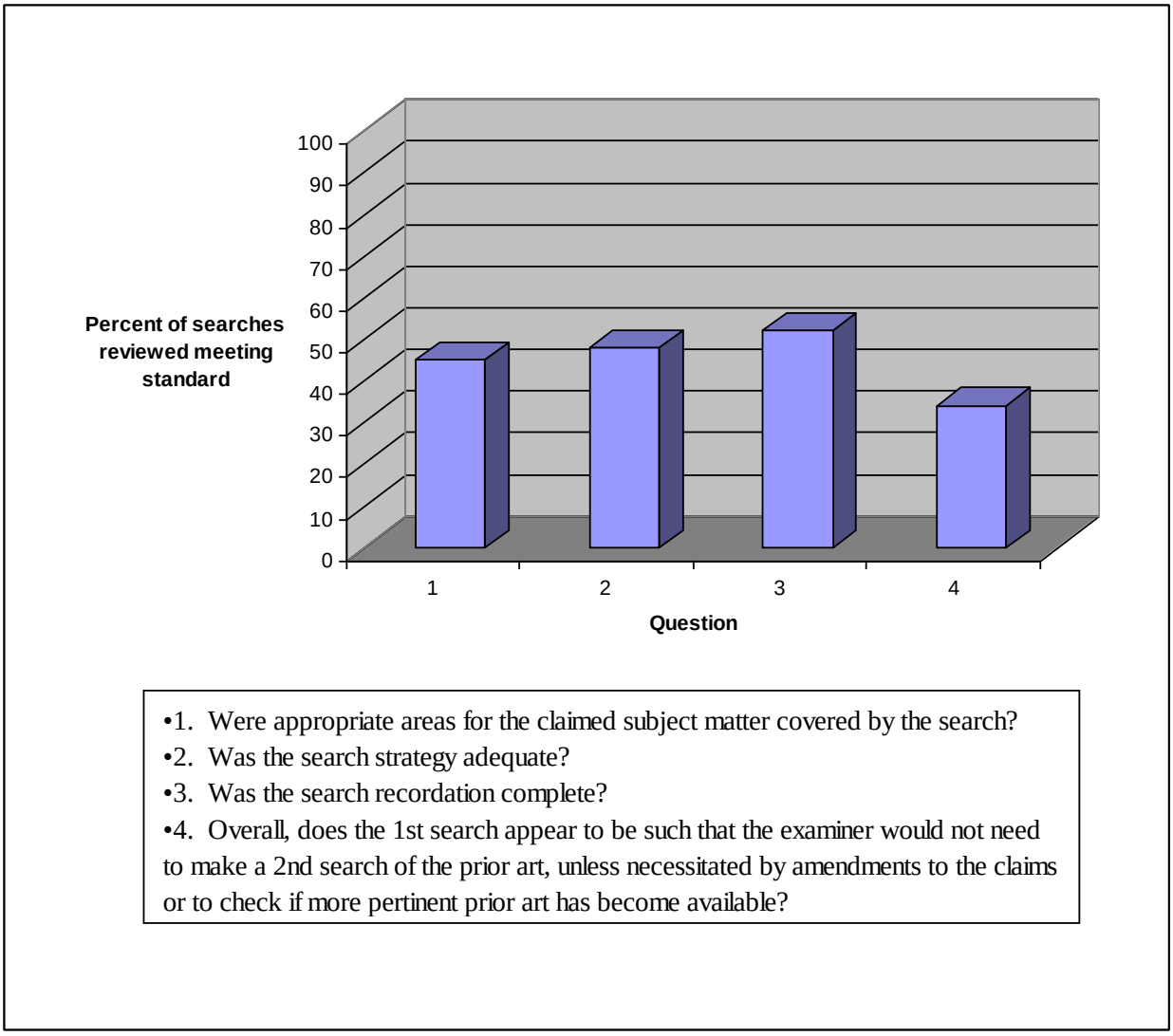

Fig. 4.9: Review of FAI Prior Art Searches (Office of Patent Quality Assurance, 2008)

Analyze

It is clear that examiners do not fully understand the new FAI process. One of the causes of this could be that the FAI pilot program is not yet fully electronic. This means that, unlike the standard process, hard copies of papers must be submitted instead of electronic copies. Another issue is that the checklist given out to examiners for FAI applications is not mandatory to fill out. This leads the examiner to pass it off as unimportant, thus often ignoring it.

4.3.2 Examiner Training

Define

The second opportunity for improvement with the FAI pilot process was that there is insufficient training on the process for examiners. As with the first opportunity for improvement, this opportunity for improvement was brought to our attention by The TC statistics lead. He informed us that examiners attend an hour-long presentation with a slideshow that gives an overview of the process, and after these examiners attend the presentation, they are expected to be able to carry out the process as efficiently as they would carry out a normal examination for which they have had at least eight months of training.

Measure

We received feedback concerning this opportunity for improvement from the FAI TC lead, and our project liaison. The FAI TC lead believes that the FAI training for examiners is not nearly enough to flawlessly carry out the process, especially because examiners may not actually see an FAI application until a few months after the training. Our project liaison also informed us of the other pilot programs that are being implemented in TC 2100. With at least four other pilot programs being implemented into TC 2100, examiners must take extra time to identify what program, if any, the application is a part of and then consult with a supervisor concerning any questions they may have about the process.

Analyze

Considering the feedback from the FAI TC lead and our project liaison, it is implausible to increase the amount of training time. If it were to be increased for FAI, then it would have to be increased for the other pilot programs in order to be sure that examiners are equally proficient at all the procedures in all the pilot programs. This would take up far too much of an examiners time (at least a few more hours of training per pilot program) and cost a great deal of money

(number of examiners times training pay times training time). What could be helpful would be a source of information on each pilot program. It could be a person who knows the processes very well such as a TC lead or a web site that has all the information about how to conduct each part of the FAI, or any pilot process. A frequently asked questions list would also be helpful as it seems that many examiners are sharing the same issues.

4.3.3 Comparing FAI to the Standard Process

Define

It was difficult to address the third opportunity for improvement because we could not accurately compare the FAI pilot program to the standard process due to the small amount of available quality data and lack of information concerning the views of the applicants and the examiners on the process. In order to improve FAI and to be able to make a reasonable comparison between FAI and the standard patent process TC 2100 will need more information about what the examiners think about the pilot program as well as what the applicants think.

Measure

The FAI TC lead informed us of an optional survey that had been sent to examiners that has resulted in a limited number of responses (about 20). She also informed us that, due to legal issues, it was very difficult to get feedback from applicants. She also informed us that, due to union regulations, we were not allowed to interview examiners ourselves.

Table 4.2 shows the majority of examiners who responded believe that the interview is helpful to the patent process. The FAI TC lead indicated that this survey was only in its preliminary stages and probably would not give a reliable idea of what examiners really think about the process.

Table 4.2 Examiner Survey Responses

7. Please inicate the degree to which you agree or disagree with the following statements:							
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Rating Average	Response Count
The interview was helpful in clarifying the issues.	0.0% (0)	15.8% (3)	21.1% (4)	**47.4% (9)**	15.8% (3)	1.00	19
The applicant was familiar with the proposed rejections and references cited in the Pre-Interview Office Action.	5.6% (1)	11.1% (2)	22.2% (4)	**50.0% (9)**	11.1% (2)	1.00	18

The TC statistics lead provided us with an update on how many applications have been through each stage of the FAI process.

Table 4.3: FAI application status data

Applications	Stage In FAI process
493	Joined the pilot
244	Pre-interview communications mailed
145	Interviews conducted
110	First action interview office actions have been mailed
43	Allowed(total)
24	Allowed after interview and prior to first action interview office action
18	Allowed prior to pre interview communication
1	Allowed after mailing first action interview office action
11	Abandoned

These numbers tell us that. The FAI pilot program is only in its early stages. There have been 110 office actions mailed but only one allowance from those. This means there has not been enough time for the applicants to respond to the FAI office actions.

Analyze

The initial survey results imply that FAI is a success from a statistical point of view. However, there are not nearly enough responses to this survey to be able to draw any definitive conclusions about the process. As seen in Table 4.2, only nineteen examiners responded to that question. We also noted that examiners may have a negative opinion of the FAI pilot program because of all the other pilot programs that they must also deal with. We believe that these factors may be distorting the results because examiners may not be taking the survey seriously.

The statistics that we received from the TC statistics lead indicate to us that it is too early in the program to be able to perform an analysis on the effectiveness of the FAI pilot process because there have not been enough cases disposed of. What we were able to say about the small amount of data is that some applications are taking less than one office action to be disposed of. This is a very good sign since the point of FAI is to reduce the amount office actions per disposal. If the application only took a single office action or less, the average amount of time it would take to dispose of an application, on average, would be the current average time for a first action to be sent out for the standard process which is 28.2 hours of examiner work as opposed to the 30.6 hours that it takes to dispose of a standard application. To be able to more accurately perform an analysis on how much time can be saved through the first action interview process, sufficient time must be given to let the applicants respond to the FAI office action and for those cases to be disposed of.

These gaps in data impede future research concerning possible improvements to the patent process. Fifty-four application disposals are not nearly enough to perform an accurate analysis on the FAI process. In addition, it is difficult to know what to improve when there is little or no feedback from the applicants and examiners. It may be difficult to get a questionnaire approved to give to applicants, but it is even more difficult to improve a process when we are not sure what the opportunities for improvement are.

5.0 Conclusions and Recommendations

After reviewing and analyzing the standard, AE and FAI processes, we were able to come to some conclusions on whether the FAI and AE pilot programs would be beneficial for TC 2100 to pursue further with the intention eventually replacing the standard examination process. Both processes take less time than the standard examination process, but both pilot programs still require significant additional research and improvements if they are to be deployed on a larger scale in the USPTO or even in TC 2100. We were able to use the quantitative and qualitative data on the standard, AE and FAI processes to perform a Six Sigma style analysis. We identified opportunities for improvements with each of the AE and FAI pilot processes that would cause them to be less efficient than the standard process, took measurements which consisted of management feedback and quality data, and we analyzed the data to find the source of the opportunities for improvement and compare the processes to the standard process of patent examination. This technique provided us with the results that the USPTO will need to carry out the next step of the Six Sigma process which is making improvements. In this chapter, we cover and what we found for each pilot program in section 5.1, recommendations that can be made to improve each pilot program in section 5.2 and what can be done for future quality management of the pilot programs in section 5.3.

5.1 Summary of Key Findings

We used our results to generate what we consider to be our key findings on the AE and FAI pilot programs. These keys finding are the facts that allowed us to decide what should be done about each of the pilot processes, which we present as our recommendations later in the chapter.

5.1.1 Six Sigma Process on Accelerated Examination

In order to properly evaluate the AE program we used the Six Sigma approach of defining the opportunities for improvement, measuring and analyzing. From performing this procedure, we were able to come up with some conclusions on whether or not the accelerated examination process would be beneficial for TC 2100 to utilize on a larger scale and what the USPTO needs to do to improve the process.

We found that the accelerated examination takes much less time from submission to disposal than the standard process. If the AE process is completed with maximum efficiency, and there are no issues between the applicant and the examiner, a notice of allowance can be issued to the applicant within 6 months of filing. If not, the longest it will take is 12-14 months. This is very beneficial for the applicants. Some applicants do not want to wait up to 3 ½ years from their filing date for their patent to be issued because their patent may be technologically out of date by that time. One major reason the AE process is much faster than the standard examination is because applications for AE are looked at by examiners within two weeks of filing, while standard applications are picked up in order and can have over a two and a half year backlog. Even without this backlog, the AE process has proved to take up to three months less than the standard examination over the past fiscal year. It is also important to realize that if applications are being taken out of order, for AE, the examiners reviewing those applications are not reviewing standard applications, thus not reducing the backlog.

Another finding in our research of the AE process was that 70% of disposals for the AE process were allowing patents compared to only 38% for the standard process over the last fiscal year. An issue that this brings up and can be examined further is the cause of this, one reason might be that the applications are pre-screened when granted AE petition status. The higher

allowance rate is significant because the more patents the USPTO allows, the more money they make in maintenance fees. One aspect of the process that is not yet known thoroughly is the quality of the patent decisions and if any issues have been found that can explain the higher allowance rate.

5.1.2 Six Sigma Process on First Action Interview

Once we understood the FAI process we found three major opportunities for improvements in the process and applied Six Sigma to these problems in order to find areas for improvement. The first problem was that examiners were not following the proper procedure. Specifically, most examiners were not submitting adequate recordation of their prior art searches or interviews with applicants. There was a lack of inclusion of search strategies and areas searched. It is likely that this problem is due to the fact that the FAI pilot program has not always been electronic. This could have caused a great deal of disorganization because examiners are not used to a non-electronic examination process. The second problem was that examiners do not receive enough training on the pilot program. They receive an hour-long PowerPoint presentation on each pilot process and are expected to be completely proficient in each of them. It is also difficult for them to work on several different pilot programs at once. The cause of this problem is that examiners are very busy and do not have a great deal of time for extra training. The third problem was that there is only a small amount of quality data on the FAI process, an even smaller amount on examiner feedback, and no existing system for soliciting applicant feedback. These three factors are crucial for comparing the FAI pilot program with the standard process. Causes of this problem include that only a small percent of processed applications are reviewed, examiners cannot be required to give feedback on the pilot program due to union

regulations, and there is great deal of legal work needed to be able to send a questionnaire out to applicants for feedback.

5.2 Recommendations

Based on our Six Sigma analysis of each of the opportunities for improvement affecting each of the pilot programs we were able to develop recommendations that the USPTO should consider while improving the processes. Please note that these recommendations are not the only ways to take advantage of these opportunities for improvement in the FAI and AE pilot programs, but, based on the current data, they provide possible courses of action that are likely to improve the processes since they directly address the opportunities for improvement.

5.2.1 How to Improve Accelerated Examination

One issue that seemed to be a big problem for the AE process was that it was difficult for supervisors to keep track of the AE applications and make sure that all deadlines are being met. There is an Excel spreadsheet that is used to keep track of AE applications, but none of it is automated. There are so many applications that it is difficult for one person to keep track of all of them. This can lead to applications falling behind in the examination process or even getting lost. A recommendation that we have that could help keep things more organized would be to have a computer program developed that allows the examiners and supervisors to input data to help keep track of applications. This program could also have a feature that keeps track of how long an application is at each step in the process, and it would notify both the supervisor and the examiner when deadlines are approaching or have been missed. Using such a program would add structure to the process and make it easier for the supervisor to keep track of the applications. A

database with these specifications could also give feedback on whether the process can be adjusted, if deadlines are being met early or consistently missed.

Another recommendation that we have for the AE process is that more quality management needs to be done. Before this process can be used on a larger scale, it is important to make sure the patents that are being allowed are quality patents, and that all prior art searches have been thoroughly completed. Due to the faster examination, there could be a greater chance of error, and it is important to make sure that is not the case.

Our last recommendation for AE is that there should be a way to keep track of the total interview and conference hours for all examiners and SPE's. We recommend this because interviewing and conference are different from regular examining hours and in order to determine if AE is actually saving money, the number of interview and conference hours must be included in the comparison.

5.2.2 How to improve First Action Interview

We believe that once the process becomes electronic that the problem with examiners not submitting search and interview summaries will clear upon. This could be further ensured by having an electronic checklist that the examiners must update every time they complete a task on the application they are examining. Each examiner's checklist could be complied in a database so that their supervisor can make sure they have submitted a proper recordation for their search. Since it might be some time before the FAI pilot program becomes electronic, for the time being, it would be beneficial to have examiners hand in their FAI checklists with work attached. This way the supervisor will know how far an examiner is on an application and that their work has been done correctly.

Making FAI electronic would also help solve the problem of insufficient training for examiners. With an electronic FAI program, tutorials should be set up that can help an examiner if he or she has any questions about the process. It should contain information on how to perform a proper search for FAI, reminders to submit recordation of work, and information on conducting an interview with an applicant. Also, there should be a pilot program assistant that can answer any questions about any of the pilot programs either by email or phone. With these resources examiners would be more accountable for their work.

A possible course of action concerning examiner training would be to train only a few examiners on the FAI pilot program and have those examiners work exclusively on FAI cases. This way the examiners will get used to processing FAI applications which will produce more accurate quality FAI quality data. The data would be more comparable to the standard process since the FAI examiners will be just as comfortable processing an FAI application as a normal examiner is processing a standard application.

A specific part of data that should be checked constantly for FAI is the number of office actions per disposal. After sufficient time has passed and there is enough data to be able to accurately compare the FAI pilot process to the standard process the number of office actions per disposal should be compared. If the number of office actions per disposal for FAI is lower than the number for the standard process (we expect it will be) then it will be proven that FAI is doing what it was meant to do and is ready to be implemented in other Technology Centers.

Our last recommendation for FAI is that there should be a way to keep track of the total interview hours for all examiners and SPE's. We recommend this because interviewing hours are different from regular examining hours and in order to determine if FAI is actually saving money, the number of interview hours must be included in the comparison.

5.3 Possibilities for Future Quality Management

This project does not complete the assessment of the quality of the AE and FAI pilot programs. This project is only the beginning of the quality management process. One goal of TC 2100 should be to become ISO 9000 certified. This would mean that a quality management system (QMS) would have to be developed which includes having a way to measure quality. This project has provided an example of a quality management system that has worked well to identify, measure and analyze problems in two different processes. We recommend that the USPTO use Six Sigma as a QMS for all processes because of its versatility and effectiveness.

5.3.1 Developing an ISO 9000 Quality Management Manual

One of the major objectives that must be completed in order to become ISO 9000 is to develop a quality management manual which explains the QMS being used to continuously improve the processes within the office. As mentioned previously, Six Sigma can be used as this QMS since it provides the methods for continuous improvement required for ISO 9000 certification. The manual is not required to contain quality management systems for every individual process. Instead, the manual must provide a dynamic quality management system that can be applied to nearly any process (For example: Six Sigma).

5.3.2 More ways to Measure Quality of Pilot Programs

One final, general recommendation we have to make is that the USPTO should try to get more feedback from examiners and applicants. ISO 9000's main focus is customer satisfaction. Applicants and examiners can both be considered customers of the pilot programs because they both have to use them. It may be difficult to get past union and legal hurdles surrounding the solicitation of examiners' and applicants' feedback, but we believe that it would be worth the trouble to get their input.

We hope that our project will be of help to TC 2100. The conclusions we have drawn are all based on the best data available, and the recommendations we have made are the best courses of action from our point of view. Whether or not TC 2100 decides to implement our recommendations, we hope that this project helps with the improvement of the First Action Interview and Accelerated Examination Pilot Programs.

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Appendices

Appendix A – Acronyms

AE – Accelerated Examination

AESD – Accelerated Examination Support Document

DsAEOV - petition initially dismissed, no response received within a month, therefore AE petition processing is over (AEOV) -- we have to send a letter to the applicant indicating that

EFS – Electronic Filing System

FAI – First Action Interview

GAU – Group Art Unit

IFW – Image File Wrapper

OIPE – Office of Initial Patent Examination

OM – Office Manager

OR – Original application

RCE – Request for Continued Examination

RF – Re-filed application

SPE – Supervisory Patent Examiner

SSP – Shortened Statutory Period

TC 2100 – Tech Center 2100

TCAED/B – Tech Center Accelerated Examination Designee/ Backup

TSSAED/B – Technology Support Staff Accelerated Examination Designee/ Backup

USPTO- United States Patent and Trade Mark Office

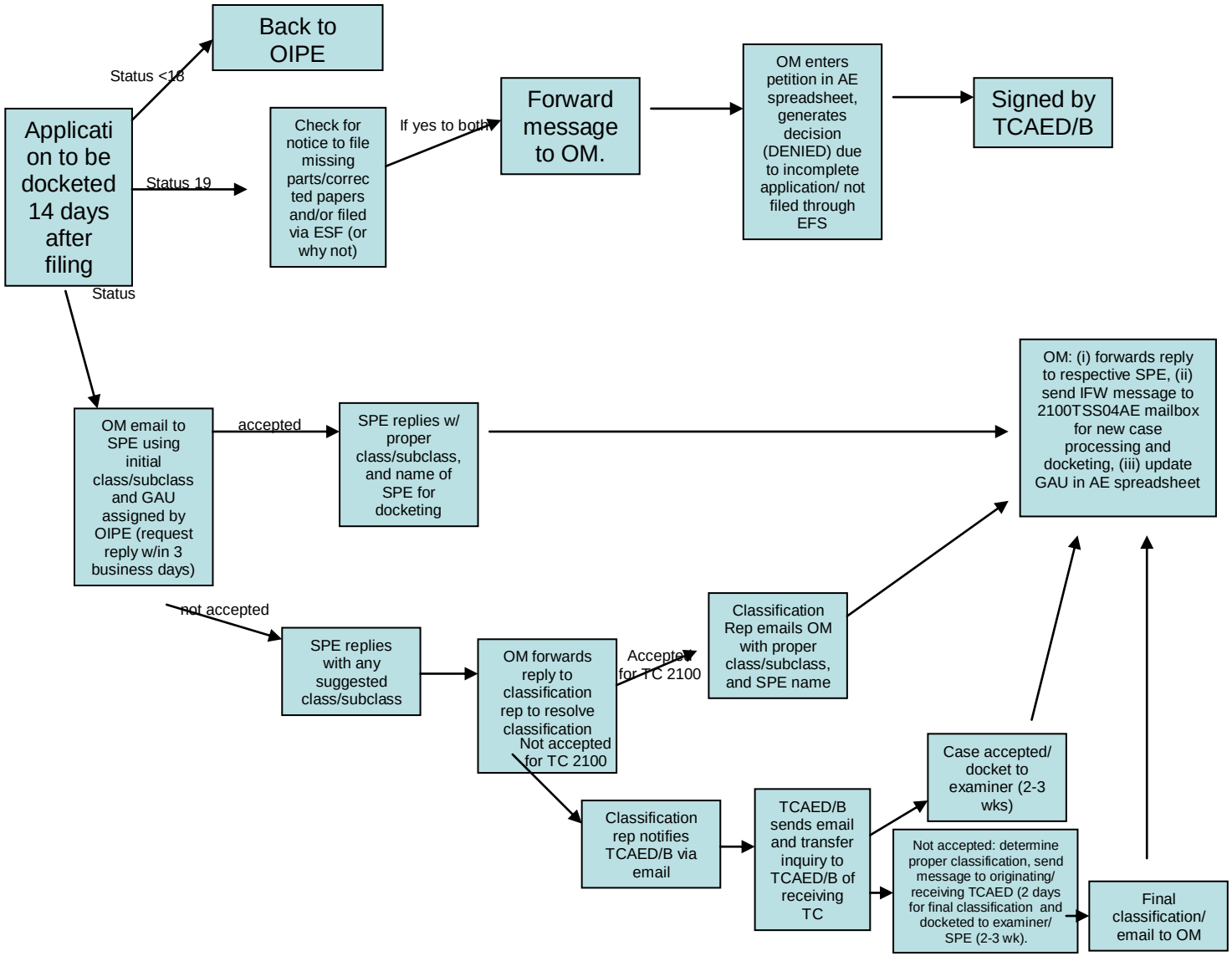
WQAS – workgroup quality assurance supervisor

Appendix B- AE detailed Flow Chart

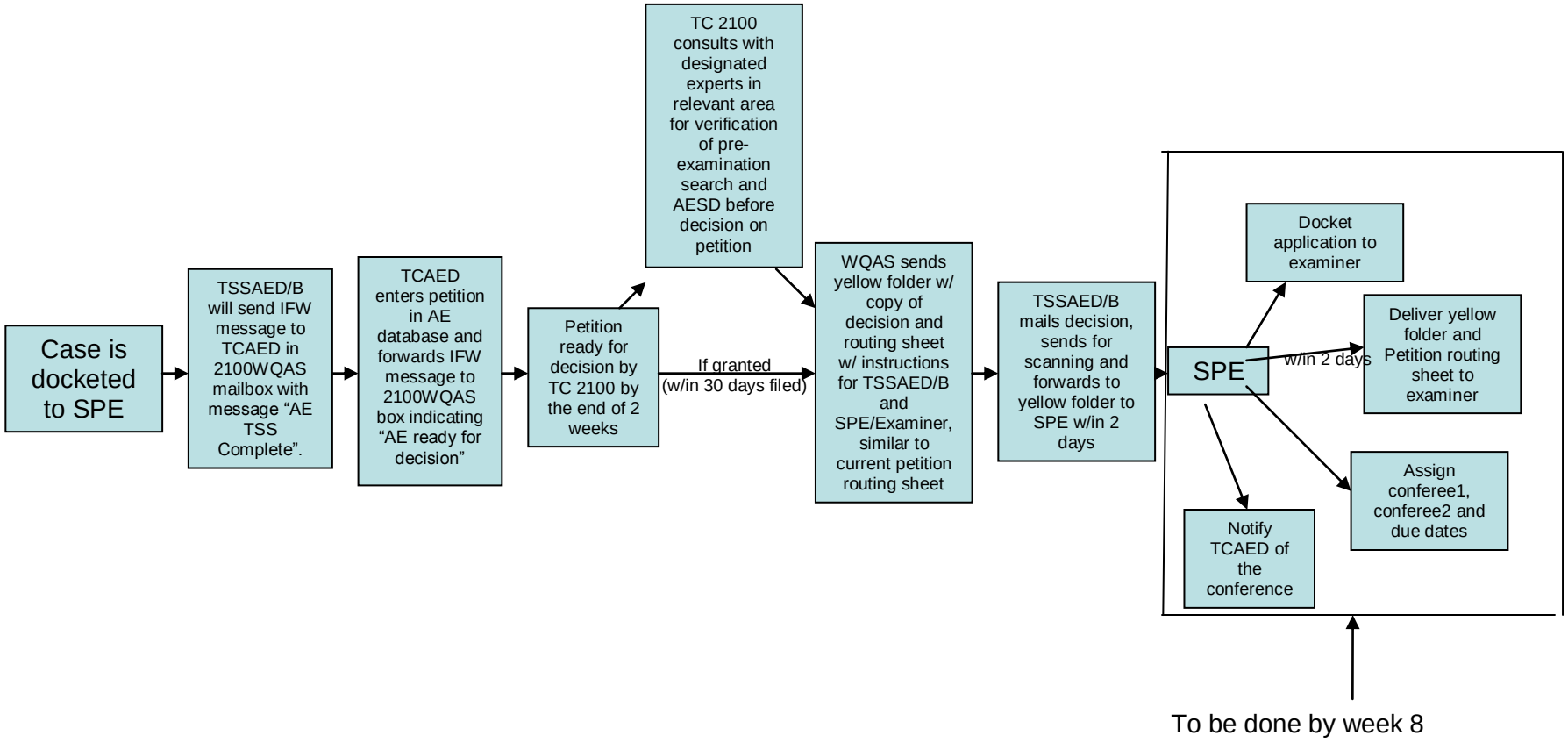
Assignment, Docketing and Decision on petition

To be completed by Week 8

Assignment, Docketing (to be completed by 14 days after Filing

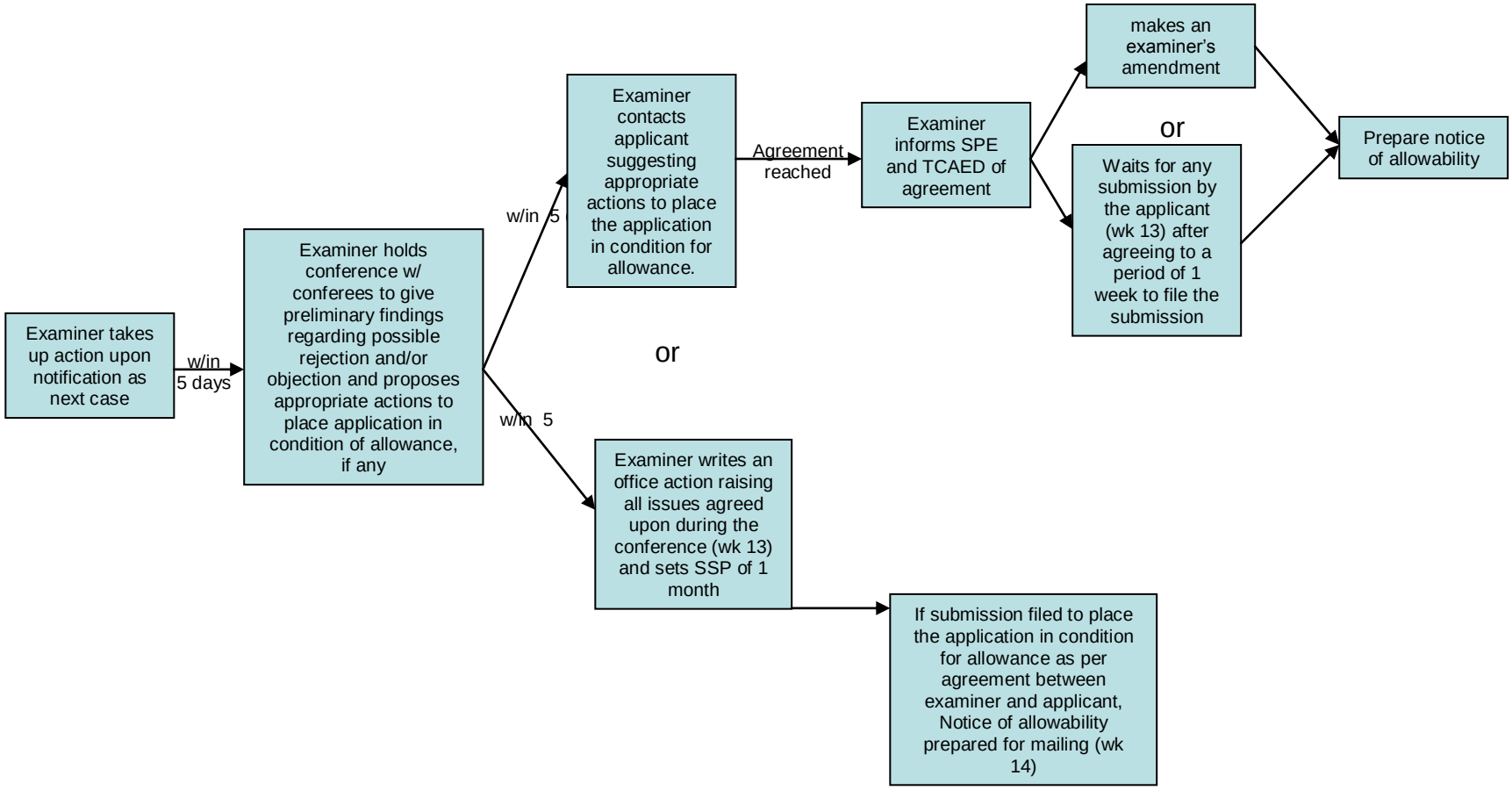


Petition Decision by WQAS and forwarding to Examiner by 30 days after filing



Preparing Office Actions

Completed by Week 14


Examiner takes up action upon notification as next case
w/in 5 days
Examiner holds conference w/ conferees to give preliminary findings regarding possible rejection and/or objection and proposes appropriate actions to place application in condition of allowance, if any
w/in 5
Examiner contacts applicant suggesting appropriate actions to place the application in condition for allowance.
Agreement reached
Examiner informs SPE and TCAED of agreement
makes an examiner's amendment
or
Waits for any submission by the applicant (wk 13) after agreeing to a period of 1 week to file the submission
Prepare notice of allowability
or
w/in 5
Examiner writes an office action raising all issues agreed upon during the conference (wk 13) and sets SSP of 1 month
If submission filed to place the application in condition for allowance as per agreement between examiner and applicant, Notice of allowability prepared for mailing (wk 14)

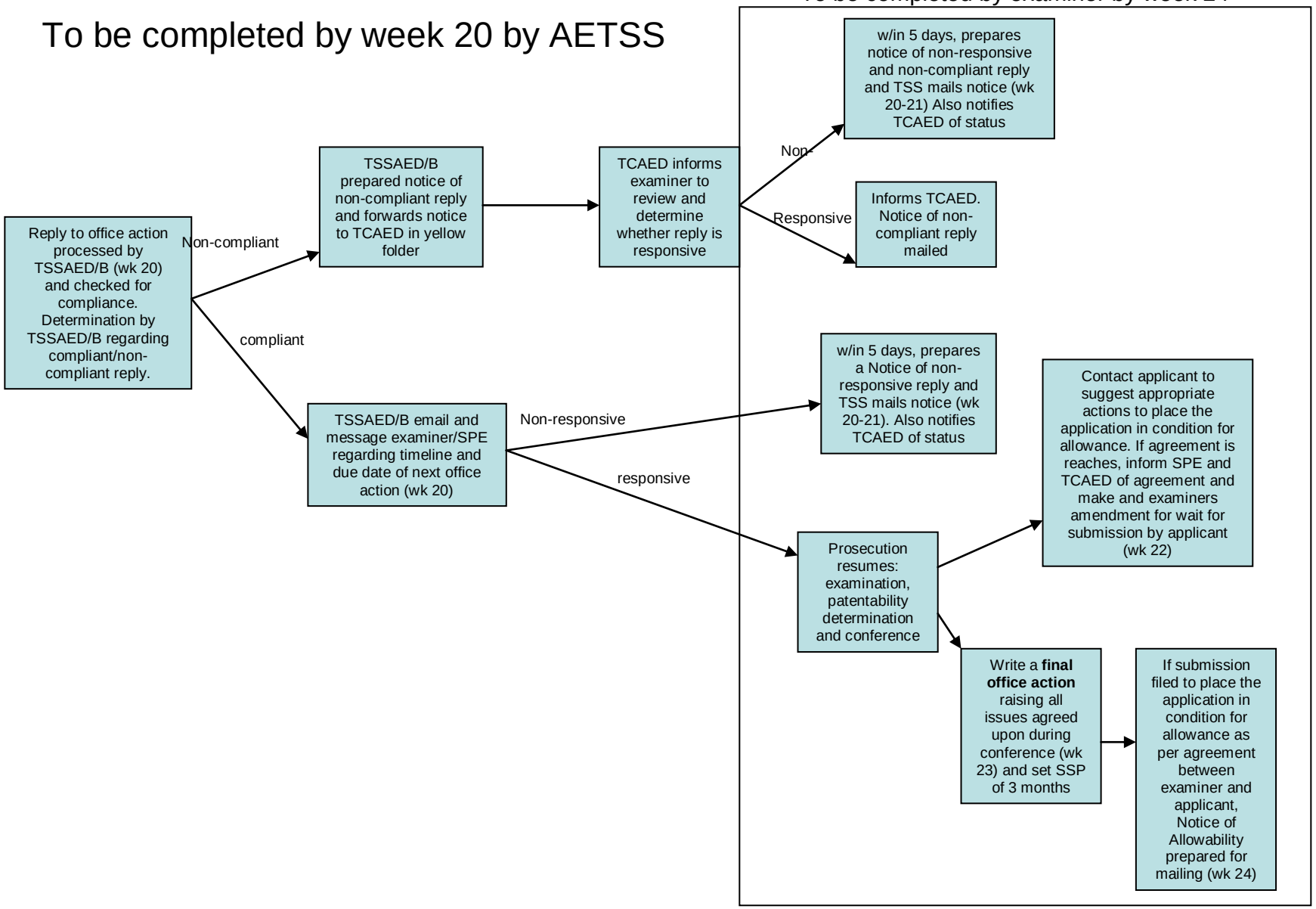
Awaiting Reply by applicant

Weeks 14-19

Reply Processing and Actions

To be completed by week 20 by AETSS

To be completed by examiner by week 24



Weeks 22-27

Awaiting reply to Notice non-compliant/non-responsive

Weeks 28+

Reply Filed. Proceed as outlined for weeks 18-23.

After Final Office Action

Prosecution proceeds at normal course until filing of RCE or conclusion of any appeal

Appendix C – Each Person in Office's Involvement in AE Process

Office Manager

W/in 14 days after filing

- Status 19 application
    - Is forwarded notice to file missing parts/corrected papers and/or filed via ESF
    - Enters petition in AE spreadsheet, generates decision (DENIED) due to incomplete application/ not filed through EFS
        - Forward to TCAED/B for signing
- Status 20
    - Emails SPE using initial class/subclass and GAU assigned by OIPE (request reply w/in 3 business days)
    - ACCEPTED
        - Receives reply from SPE w/ proper class/subclass and name of SPE for docketing
            - (i) forwards reply to respective SPE
            - (ii) sends IFW message to 2100TSS04AE mailbox for new case processing and docketing
            - (iii) update GAU in AE spreadsheet
    - NOT ACCEPTED
        - Receives reply from SPE on suggested class/subclass and forwards reply to classification rep to resolve classification
        - Accepted for TC 2100
            - Receives email from classification rep with proper class/subclass and SPE name
                - (i) forwards reply to respective SPE
                - (ii) sends IFW message to 2100TSS04AE mailbox for new case processing and docketing
                - (iii) update GAU in AE spreadsheet
        - Not accepted for TC 2100
            - Receives final classification from TCAED
                - (i) forwards reply to respective SPE
                - (ii) sends IFW message to 2100TSS04AE mailbox for new case processing and docketing
                - (iii) update GAU in AE spreadsheet

Tech Center Accelerated Examination Designee/ Backup

W/in 14 days after filing

- Dockets application
    - Less than status 18 -> back to OIPE
    - Status 19
        - Check for notice to file missing parts/corrected papers and/or filed via ESF
        - Forward to OM
        - Receives and signs declination from OM
    - Status 20
        - Forwards to OM
            - Accepted
                - Notified by classification rep
                - Sends email and transfer inquiry to TCAED/B of receiving TC
                - Accepted
                - Docketed to examiner
                - Not accepted ->to classification rep

To be done by 30 days after filing (after case is docketed to SPE)

- Sends IFW message to TCAED in 2100WQAS mailbox indicating "AE ready for decision"

To be done by week 8

- Notified of the conference by the SPE

To be done by week 14

- Informed by examiner of agreement from conference

To be completed by week 20

- Reply by applicant is compliant
    - Emails and messages examiner/SPE regarding timeline and due date of next office action (wk 20)
    - Non responsive
        - Notified by examiner of non-responsive reply
    - Responsive
        - Notified of agreement by examiner if agreement is reached
- Reply by applicant is non compliant
    - Prepares notice of non-compliant reply and forwards notice to TCAED in yellow folder (by week 24)
    - TCAED informs examiner to review and determine whether reply is responsive
        - Responsive -> informed by examiner (by week 24)
        - Non-responsive -> notified by examiner of notice of non-responsive and non-compliant (by week 24)

Supervisory Patent Examiner

To be completed by 14 days after filing (Status 20)

- Receives email from OM with initial class/subclass and GAU assigned by OIPE (reply requested w/in 3 business days)
- ACCEPTED
    - Replies to OM w/ proper class/subclass, and name of SPE for docketing
- NOT ACCEPTED
    - Replies to with any suggested class/subclass

By 30 days after filing

- Receives yellow folder w/ copy of decision and routing sheet w/ instructions

To be done by week 8

- Receives yellow folder from TSSAED/B
    - Docket application to examiner
    - Deliver yellow folder and petition routing sheet to examiner
    - Assign Conferee 1, conferee2 and due dates
    - Notify TCAED of the conference

To be completed by week 14 (w/in 5 days after conference if agreement is reached)

- Informed by examiner of agreement

To be completed by week 20

- Emailed by TSSAED regarding timeline and due date of next office action (wk 20)

To be completed by week 24

- Informed by examiner of agreement is reached with applicant

Examiner

Gets case docketed to them by weeks 2 or 3

- Receives yellow folder w/ copy of decision and routing sheet w/ instructions (similar to current petition routing sheet) from WQAS

Done by week 8

- Docketed application
- Receives yellow folder and petition routing sheet

To be completed by week 14

- Takes up action upon notification as next case
- w/in 5 days holds a conference w/ conferees to give preliminary findings regarding possible rejection and/or objection and proposes appropriate actions to place application in condition of allowance, if any

w/in 5

- days contacts applicant suggesting appropriate actions to place the application in condition for allowance
    - agreement reached:
    - informs SPE and TCAED of agreement
        - makes and examiners amendment

      or
        - waits for any submission by the applicant (wk 13) after agreeing to a period of 1 week to file the submission
    - prepare notice of allowability

or

- Examiner writes an office action raising all issues agreed upon during the conference (wk 13) and sets SSP of 1 month
- Prepare notice of allowability for mailing

To be completed by week 24

Non-compliant

- Informed by TCAED to review and determine whether reply is responsive
    - Non-responsive
        - w/in 5 days, prepares notice of non-responsive and non-compliant reply also notifies TCAED of status
    - Responsive
        - Informs TCAED. Mails notice of non-compliant reply

Compliant

- Informed by TSSAED/B by email regarding timeline and due date of next office action (wk 20)
    - Non-responsive
        - w/in 5 days, prepares a notice of non-responsive reply and
    - Responsive
        - Prosecution resumes: examination, patentability determination and conference

- Contact applicant to suggest appropriate actions to place the application in condition for allowance. If agreement is reached inform SPE and TCAED of agreement and make an examiners amendment or wait for submission by applicant
- Write a **final office action** raising all issues agreed upon during conference (wk 23) and set SSP of 3 months
    - If submission filed to place the application in condition for allowance as per agreement between examiner and applicant. Notice of Allowability prepared for mailing (wk 24)

Tech Support Staff Accelerated Examination Designee/ Backup

To be completed by 30 days after filing

- Sends IFW message to TCAED in 2100WQAS mailbox with message "AE TSS complete"
- Receives yellow folder w/ copy of decision and routing sheet w/ instructions
- Mails decision, sends for scanning and forwards to yellow folder to SPE w/in 2 days

To be completed by week 20 by AETSS

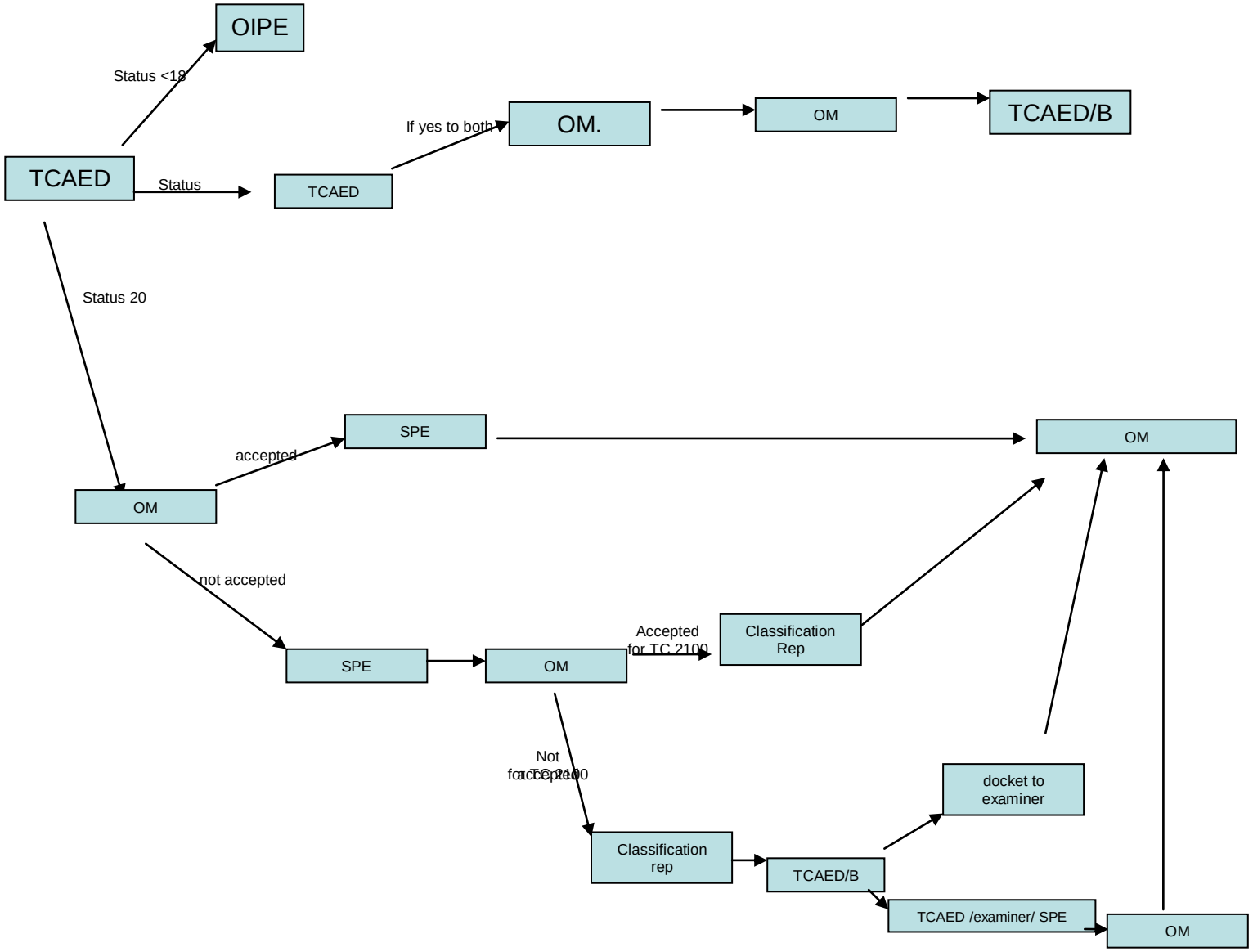
- Reply to office action and checked for compliance. Determination regarding compliant/non-compliant reply
    - Non-complaint
        - Prepared notice of non-compliant reply and forwards notice to TCAED in yellow folder
    - Compliant
        - Emails and messages examiner/SPE regarding timeline and due dates of next office action (wk 2

Appendix D – AE flow Chart (only showing people involved)

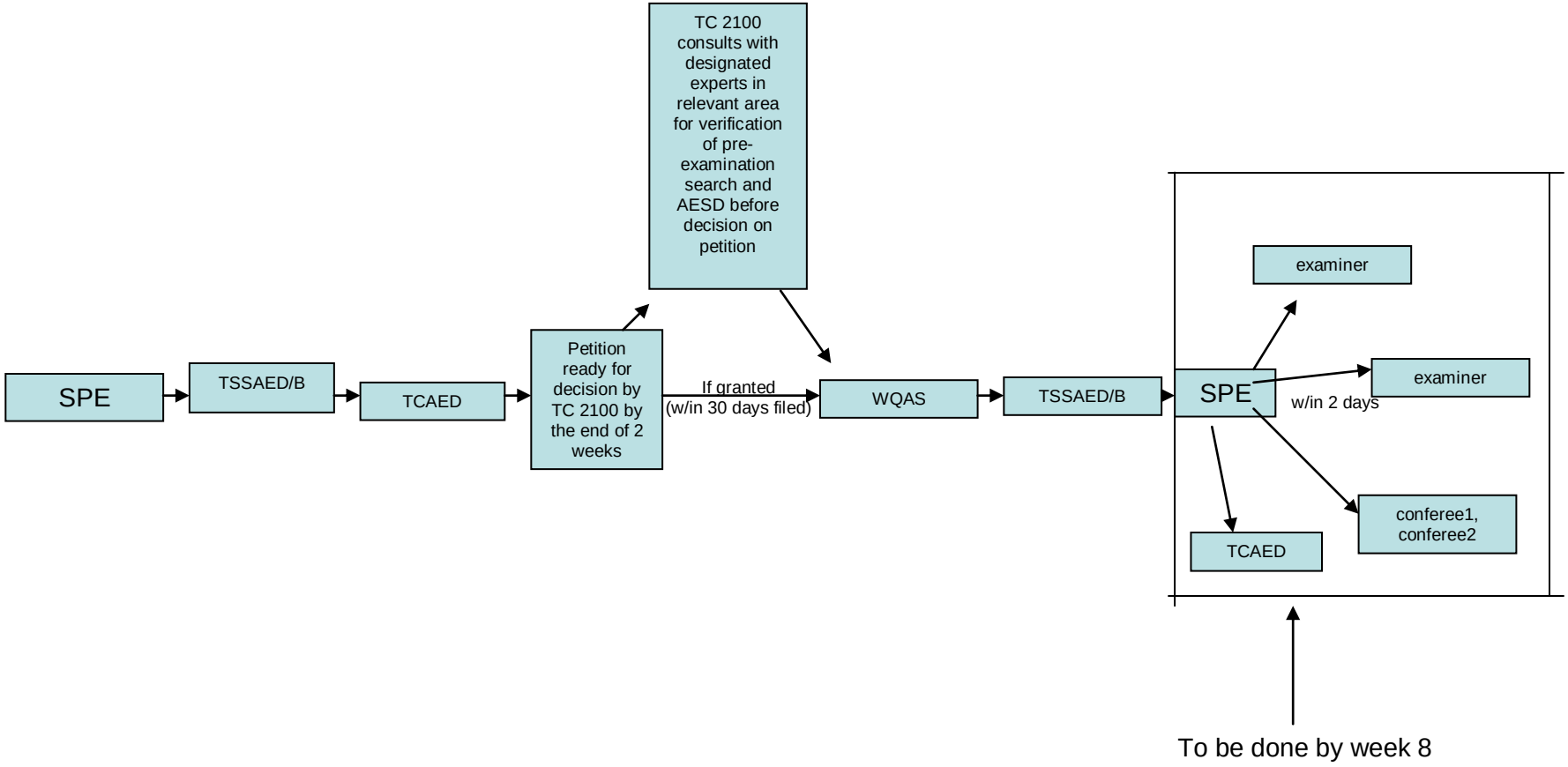
Assignment, Docketing and Decision on petition

To be completed by Week 8

Assignment, Docketing (to be completed by 14 days after Filing

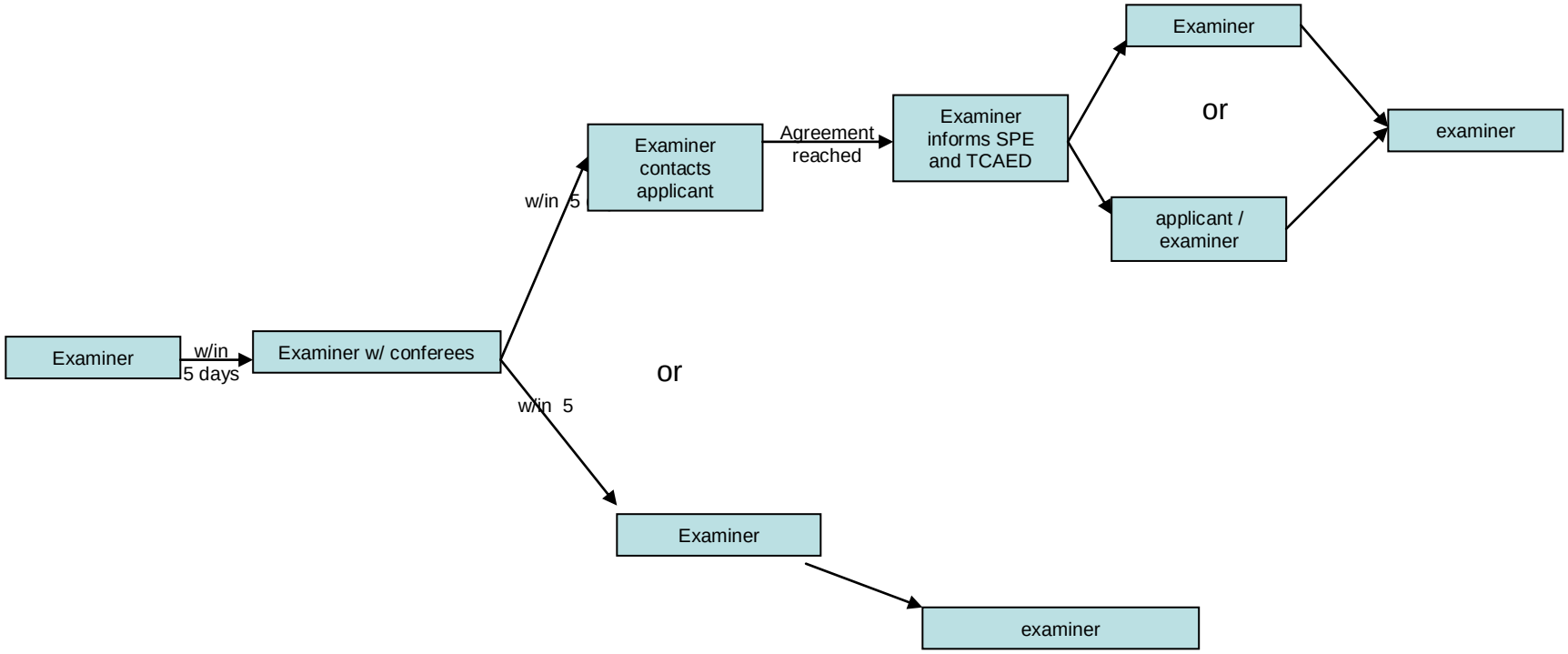


Petition Decision by WQAS and forwarding to Examiner by 30 days after filing



Preparing Office Actions

Completed by Week 14


Examiner
w/in
5 days
Examiner w/ conferees
w/in 5
Examiner contacts applicant
Agreement reached
Examiner informs SPE and TCAED
Examiner
or
applicant / examiner
examiner
or
w/in 5
Examiner
examiner

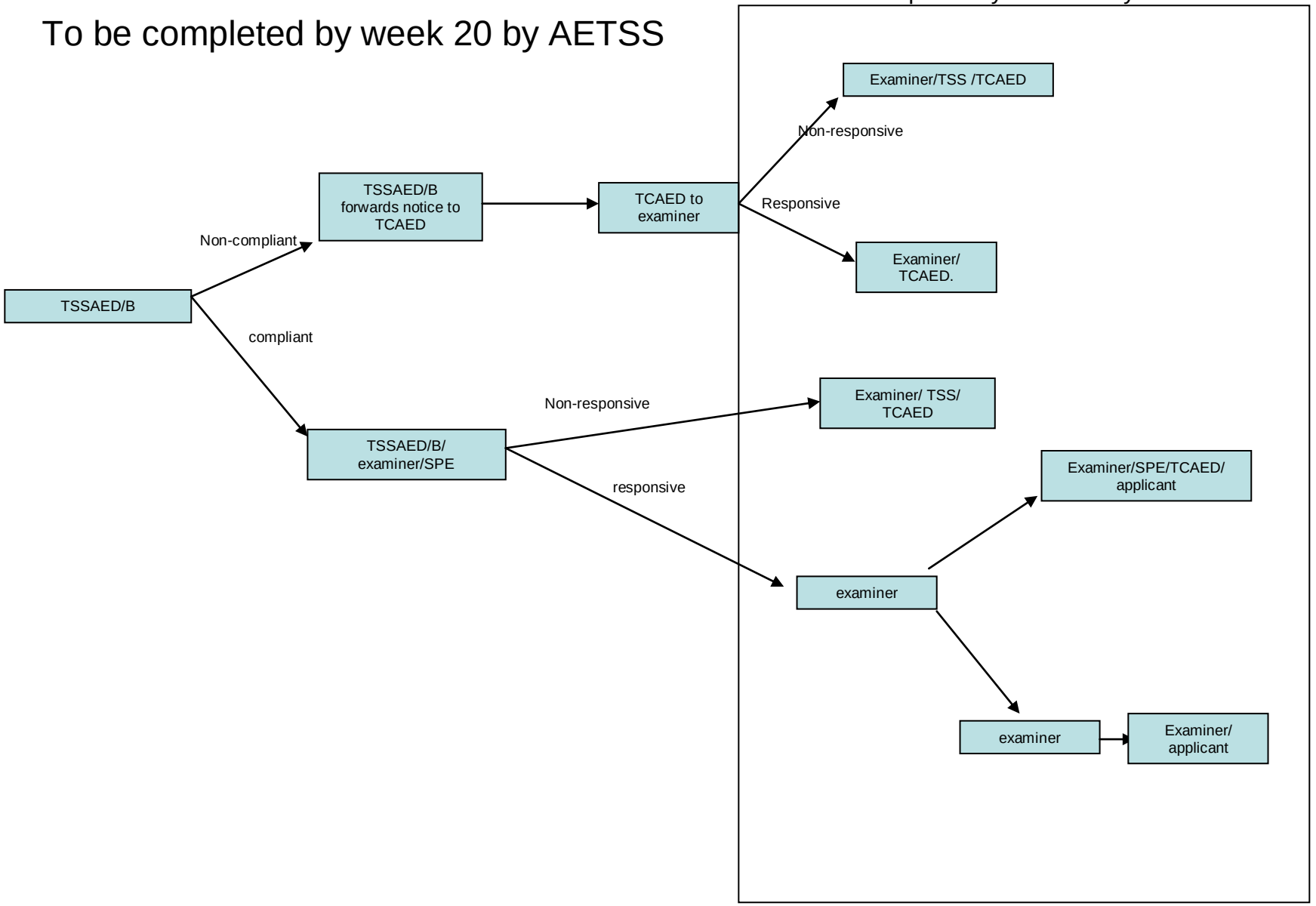
Awaiting Reply by applicant

Weeks 14-19

Reply Processing and Actions

To be completed by week 20 by AETSS

To be completed by examiner by week 24



Weeks 22-27

Awaiting reply to Notice non-compliant/non-responsive

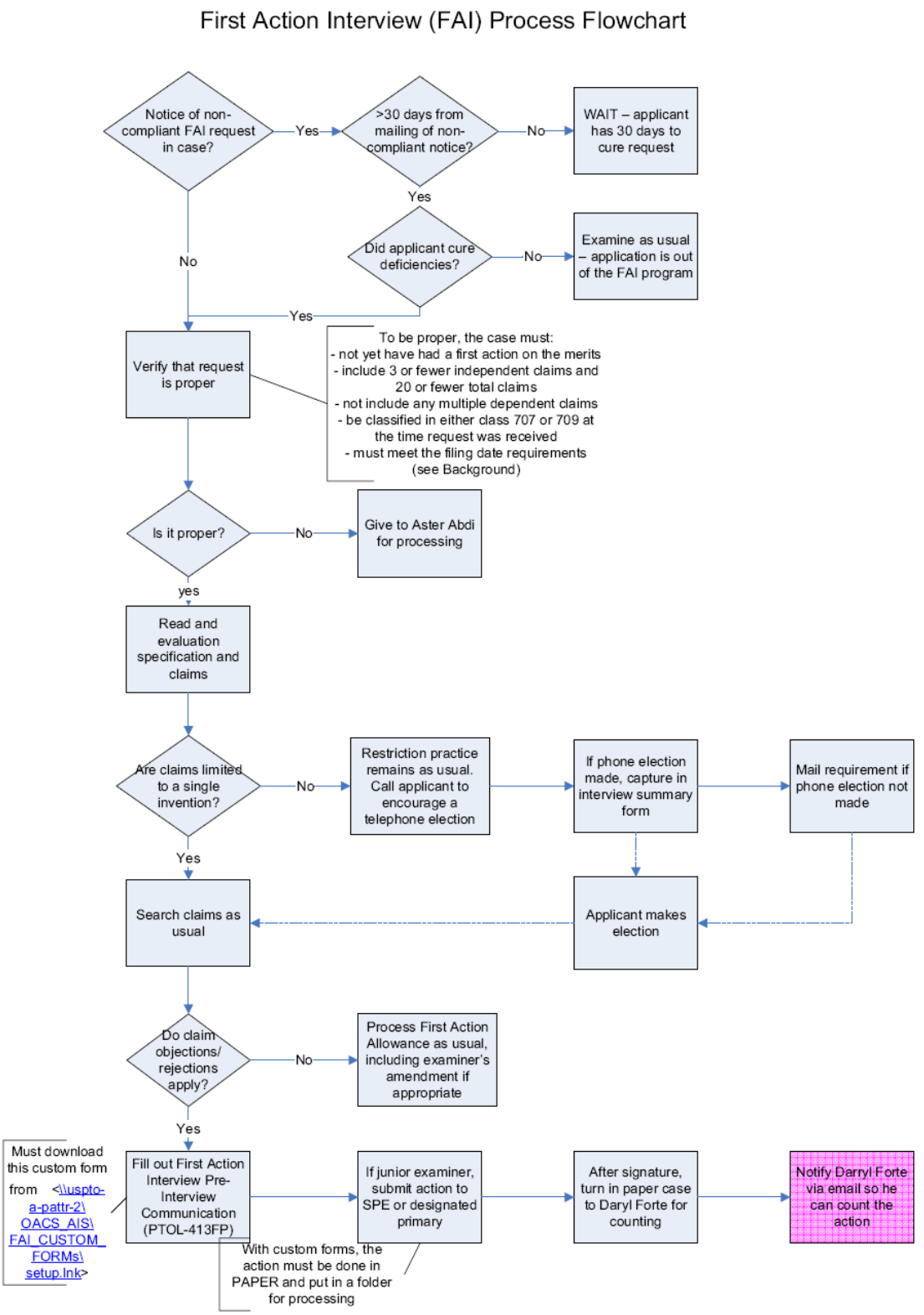
Weeks 28+

Reply Filed. Proceed as outlined for weeks 18-23.

After Final Office Action

Prosecution proceeds at normal course until filing of RCE or conclusion of any appeal

Appendix E – Detailed Flow Chart of FAI process (provided by internal USPTO source)



Appendix F – Interview Transcripts

Interview Transcript
Interviewee: FAI TC lead, Supervisory Patent Examiner
Date 11/6/2008

Besides the interview, is the rest of the FAI process the same as the standard process?

- It is very close to the same
- Examiners fill out pre-interview communication instead of making a first office action
- First office action occurs after interview.

How long has FAI been running?

- Since April, 2008
- Not very long for a pilot program

How is the FAI process running?

- Very smoothly so far
- No major problems

Have there been any complaints?

- Examiners do sometimes get overwhelmed with all the nine other pilot programs

Interview Transcript
Interviewee: AE TD lead, Supervisory Patent Examiner
Date 11/10/2008

What is your involvement in the Accelerated Examination process?

- Make sure AE applications in TC 2100 are docketed to correct examiners
- Make sure all applications meet deadlines
- Keep track of application statuses

Are there currently any problems with the AE program?

- Currently not organized method for keeping track of all AE applications
    - Only Excel spreadsheet where data is manually put in and status's must be changes on a daily basis

What can we do to help you manage AE in TC 2100?

- Suggest a better method for keeping track of applications

Interview Transcript
Interviewee: FAI Statistics Lead, Supervisory Patent Examiner
Date 11/12/2008

What are some of the problems with the first action interview process?

- Examiners not submitting interview summaries/ search recordation
- Examiners do not receive a great deal of training for FAI
- Process has not been electronic for long
- Examiners get confused with all the other pilot programs being implemented

Interview Transcript
Interviewee: AE TD lead, Supervisory Patent Examiner
Date 11/12/2008

Is there currently a detailed step-by-step process for AE that we can look at?

- Yes, but it is a word document and needs to be made into a flow chart.

Is there any quality management that has been done on AE so far?

- Very limited, and there is a lack of examiner feedback

How Much time would you say you spend per week on AE related stuff?

- 20-25 hours on top of my regular SPE duties

Interview Transcript
Interviewee: FAI TC lead, Supervisory Patent Examiner
Date 11/12/2008

Have applicants been giving feedback.?

- Only by phone
- Generally positive but some negative
- Do not say how it can be improved

Have Examiners been giving feedback?

- Yes, through online survey
- Not many have taken the survey yet
- Optional due to union regulations

Interview Transcript
Interviewee: AE TSS,
Date 11/17/2008

Are there any main differences in your involvement in AE compared to that of the standard process?

- No, they are pretty much the same for what I have to do.

Interview Transcript
Interviewee: FAI TC lead, Supervisory Patent Examiner
Date 11/18/2008

What do you think about examiner training?

- Very short, only an hour
- Probably not enough to make them proficient at FAI process

Is quality data at a stage where it can be analyzed?

- No, too early
- Not many applications disposed of

Hoe much of the process is done electronically?

- Examiners have the option of organizing their work electronically
- Must submit hard copies for counting