

Software Patent Application Drafting Guideline Development

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Abstract

Software patent drafting is a promising field because top IT (Internet Technology) companies rely on software patents to protect their products. However, software patent drafting is a relatively unknown field for technical communication students. This paper answers the questions on “how to become a patent writer” and “how to draft a software patent application” This paper provides specific required skills to become a patent writer. In addition, this paper also provides specific guidelines to drafting the most important sections in a software patent application: claim, embodiment, and diagram sections. Two patent experts working for Samsung Electronics have reviewed this work and their feedback was applied to this paper.

Introduction

A patent application is a detailed description of an invention. Since patent officers use this patent application as their only evidence to decide whether the invention is patentable subject matter or not, drafting a patent application is a crucial skill when requesting patent rights.

For patent application drafting, many guidelines and textbooks detail good general drafting skills. However, there are few materials which explain good software patent application drafting skills even though the software industry is one of the most important and promising industries in the world.

Since a software program is not a tangible object and has never been patentable in the past, patent writers require specialized skills and experience to develop a patent application that includes claims, embodiments, and diagrams.

In addition, for technical writers, patent drafting is a new and promising field. Many international companies need patent agents to protect their patent rights and this job is potentially stable because drafting patent applications requires specialized knowledge.

This paper provides software patent drafting techniques for patent staff-members, inventors, and technical communication students. This guideline will focus on patent application drafting techniques that request stronger patent rights in the claim, embodiment, and drawing sections of patent applications. Moreover, this paper also provides essential steps to becoming a patent agent (writer) for technical writers and technical writing students.

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Research Method

This paper is based on the case study method. Top software companies such as Apple, Google, and Microsoft believe that patent rights are crucial to protecting their market shares. To draft good patent applications, they hire good experienced patent writers, so in general, patent applications created by such companies are top-notch. Thus, analyzing and understanding patent applications from these companies is the best method to absorb good patent drafting skills.

First of all, well-known software related patent applications are collected because major software companies such as Apple, Google, and Microsoft hire experienced patent writers. These patent documents are analyzed to extract good language expressions. Then, experienced patent agents read this and provide feedback to improve this guideline. (See Figure 1)

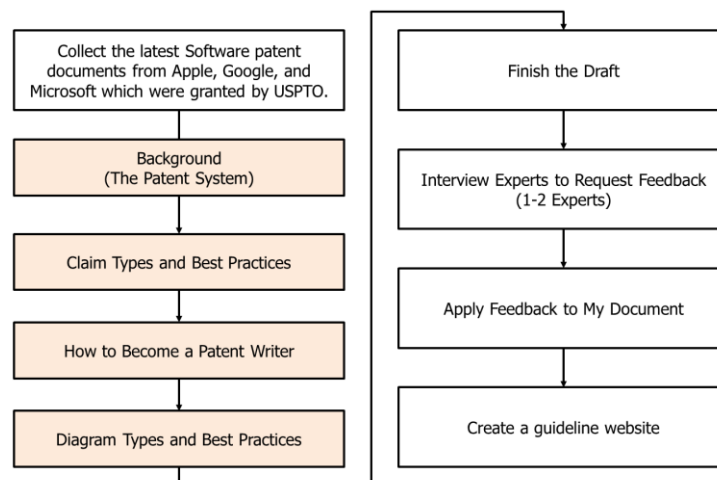


Figure 1. Detailed Research Process

Two patent experts will then answer interview questions. They worked for Samsung Electronics in Korea and are currently working toward a technical writing master's degree in the USA. They have more than 10 years of experience in patent and engineering fields. They have drafted patent applications for Samsung electronics and analyzed patent documents from the biggest electronic companies in the world. Thus, they are able to provide thorough and valuable feedback. They will be presented with ten interview questions about their educational background, becoming a patent writer, and drafting good patent applications.

Patent System

Patent drafting skill overview

A patent application is comprised of several sections which contain detailed technical descriptions and legal expressions. (See Figure 2) Clearly, writing patent applications requires specialized knowledge and skills.

(12) United States Patent Casey et al.	(10) Patent No.: US 8,364,590 B1 (45) Date of Patent: Jan. 29, 2013
(54) MOTION BASED PAYMENT CONFIRMATION	2002/0082995 A1 6/2002 Christ, IV 2003/0028481 A1 2/2003 Fitzroff et al. 2003/0115463 A1 5/2003 Hornum 2004/0034509 A1 2/2004 Robinson 2004/0081394 A1 4/2004 Beebe 2005/0086002 A1* 4/2005 Dudziawicz et al. 725/46 2005/0340278 A1 11/2005 Gerber et al. 2006/0006226 A1 1/2006 Fitzgerald et al.
(75) Inventors: Brandon J Casey, San Jose, CA (US); Gary Wipfler, Los Altos, CA (US); Erik Cressall, San Jose, CA (US)	(Continued)
(73) Assignee: Apple Inc., Cupertino, CA (US)	(Continued)
(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.	FOREIGN PATENT DOCUMENTS EP 169626 8/2006 EP 169626 A1 * 8/2006 (Continued)
(21) Appl. No.: 13/564,671	OTHER PUBLICATIONS ewallet: users guide and reference IBM Software Copyright 1997-2008 No specific date recorded.* (Continued)
(22) Filed: Aug. 1, 2012	Primary Examiner — William Rankins (74) Attorney, Agent, or Firm — Novak Druce + Quigg LLP
Related U.S. Application Data	(57) ABSTRACT Methods and devices for confirming payment transactions are provided. In one embodiment, an electronic device may include a graphical user interface (GUI) with one or more graphical elements that may be moved by a user to confirm or decline a payment transaction using a selected payment instrument. For example, a user may drag the graphical element to a confirmation position via a touch screen of the electronic device. In another example, a motion sensing device, such as an accelerometer, may sense movement of the electronic device and move the graphical element in response to the motion. Upon confirmation, payment information for the payment transaction may be transmitted to a merchant or payment recipient. Various additional methods, machine-readable media, and devices for confirming payment transactions are provided.
(63) Continuation of application No. 12/351,714, filed on Jan. 9, 2009, now Pat. No. 8,255,323.	20 Claims, 11 Drawing Sheets
(51) Int. Cl. G06Q 20/00 (2006.01)	
(52) U.S. Cl. 705/39, 705/35, 705/42	
(58) Field of Classification Search 705/35, 705/42 See application file for complete search history.	
(56) References Cited U.S. PATENT DOCUMENTS 5,390,038 A * 12/1996 Ptasoda 705/41 5,953,710 A 9/1999 Fleming 6,609,113 B1 8/2003 O'Leary et al. 6,749,144 B2 6/2004 Madani 6,902,081 B2 6/2005 Faria 7,249,092 B2 7/2007 Dunn et al. 7,331,518 B2 2/2008 Rabbe 7,333,047 B2 2/2008 Wisbe et al. 7,375,310 B2 4/2008 Calabrese et al. 7,533,059 B2* 5/2009 Gattis et al. 705/40 8,127,982 B1 3/2012 Casey 8,140,418 B1 3/2012 Casey 2002/010631 A1* 1/2002 Sato et al. 705/14 2002/0053805 A1* 5/2002 Seki et al. 705/27	

Figure 2. An Example of a Patent Application

First of all, technical knowledge is important in drafting patent applications. Inventions are the result of technical development activities. Since patent writers need to understand this technical subject matter and describe it clearly on a patent application, they should have thorough technical knowledge to draft good patent applications. Two patent experts who have more than 10 years of experience in the patent field provided feedback after reading these guidelines and

they point out that technical writers must have a thorough knowledge of technical matters to draft good patent applications.

In addition, the patent system is the impetus behind technological advances. New technologies need to present new specialized approaches to meet traditional patent requirements. Software invention is an example. Since software programs are not “tangible” objects, they are not patentable under the definition that a new, useful, and nonobvious process or product is a patentable subject matter under 35 U.S.C. (United States Constitution) §101.

To make software programs patentable, inventors must create a tangible product which contains the invented software program. For example, when an inventor puts his GPS program, which navigates cars, into a general purpose computer, this computer is not merely “a general purpose computer” anymore. This is a GPS machine, making it a patentable product even though the GPS software program itself is not patentable.

In addition to good writing skills, patent application drafting also requires the use of specialized language expressions in the patent field to make better patent applications and thus get better protection. For example, when an invention contains a particular component, patent writers need to describe it not as one component but “at least” one component. This is because if other copycats contained two or more components, they would get around the infringement if the claim stated only “a component.” This example demonstrates a need for language manipulation in patent writing. Although patent writers own their own writing inventories, they rarely share these collections. This inhibits patent writers from improving the quality of patent applications by sharing their know-how.

Patent and Software Patent

Article I, Section 8, Clause 8 of the United States Constitution states that **“To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”**

The very first purpose of the given clause - Article I, Section 8, Clause 8 – is to protect the right of intellectual property holders. There are three kinds of intellectual properties – patents, trademarks, and copyrights. The most important intellectual property is the patent, which provides exclusive rights to patent holders for a limited time. Abraham Lincoln said “The patent system added the fuel of interest to the fire of genius, in the discovery and production of new and useful things.” (Feb. 11, 1859). When there was no patent system, there was no method to protect one’s invention. Inventors spent much effort and invested human and monetary resources into developing new products yet could not protect their exclusive rights to their inventions, so they usually hid their technological details from the public. Other inventors weren’t able to build on technology that had already been invented. Thus, there were many redundant developments which stalled technological innovation because innovation is more effectively based on existing technologies.

In addition to the exclusive rights of patent holders, the given clause also protects the right of the general public. First of all, exclusive rights with rewards for a limited time motivate technology inventors. The creations improve the quality of life for the general public. People have more conveniences and can enjoy a variety of creative media. In addition, restricting the time helps the general public get full benefits from intellectual property after their rights expire. Figure 3 explains the expiration of a patent. A patent application is published 18 months after its submission, so competitors can obtain the detailed description of new technology and thus

can develop better products based on it. This patent expires after 20 years. Then the general public can use the technology and make products following the patent without paying royalties.

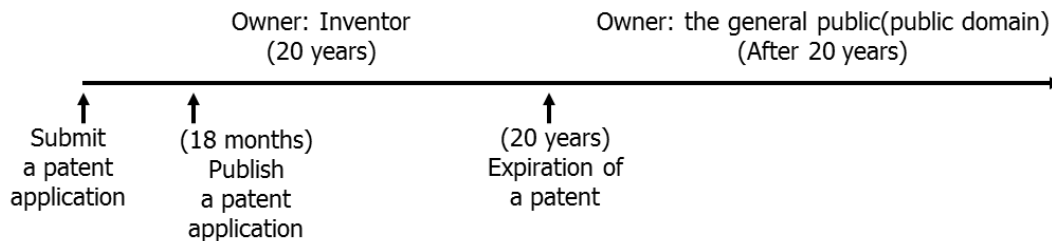


Figure 3. Patent Expiration

Since software programs are not “tangible” objects, they are not patentable under the definition that a new, useful, and nonobvious process or product is a patentable subject matter under 35 U.S.C. §101. However, nowadays, software programs have the most potential to achieve success in the market because the quality of hardware from the top electronic companies is almost the same. Customers select an electronic device because of good user interface and user experience implemented by software programs. Thus, patent writers and inventors can convert an intangible software program into a tangible product by combining the invented software program and electronic hardware. “Slide to Unlock” in Figure 4 is one of the best-known issued software patents in the world. (Apple, 2009) Basically, “Slide to Unlock” is a software program to implement an unlocking user interface. To make a patent application for this software program, Apple combines this software program with iPhone (hardware) and writes a patent application for this iPhone which contains the software program.

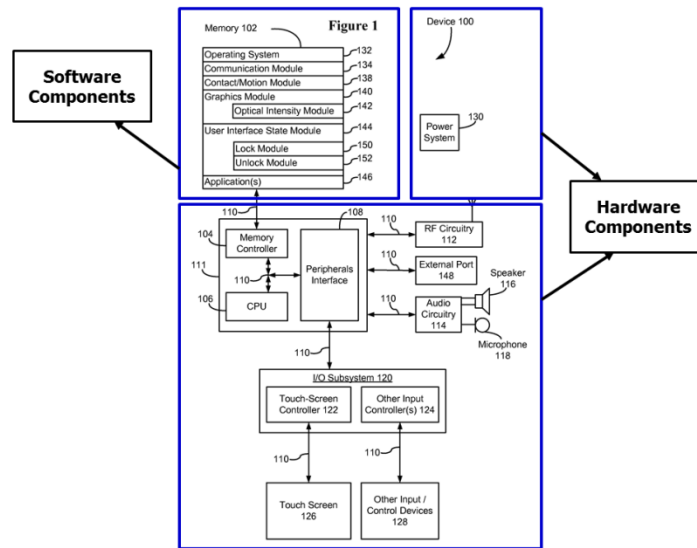


Figure 4. Internal Structure to Implement "Slide to Unlock" (Apple, 2009)

How to become a patent agent

Patent Agent as a Job

Patent agents draft patent applications and govern the patent process. This process includes drafting patent applications, receiving inquiries from patent officers, and resolving these inquiries. Patent agents work with inventors such as engineers and product developers and legal professionals such as patent attorneys. Therefore, a patent agent is a technical writer with legal and technical knowledge.

This is a good job opportunity for technical writers because many international companies need patent agents to protect their patent rights. In addition, patent agents have more stability in their job positions because of the specialized legal and technical knowledge that is needed.

Interviewees also stated that patent drafting job positions are very stable because many companies try to request patent rights to protect their products. As a result, the average salary for patent writers is higher than for other technical writers. (Oppenheimer, 2008) According to the statistics, the median expected salary for a patent agent in the United States is \$85,645 (See Figure 5) while the median expected salary for a technical writer is \$65,000. (U.S. Bureau of Labor Statistics, 2014)

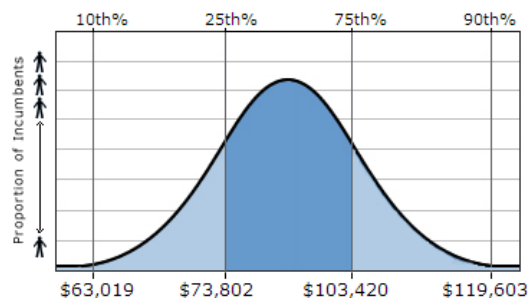


Figure 5. Income Range of Patent Agents (Salary.com, 2014)

How to Become a Professional Patent Writer

To become a professional patent writer, it is important to understand the process and requirements, and to put them into practice. This section introduces four steps to becoming a patent writer.

1. Acquire Technical Knowledge

Basically, a patent application is a description of an invention. To understand the invention itself, technical knowledge is needed. Although patent writers don't need to have technical knowledge to invent or develop a product or a process, they need to be able to understand the invention and convert its description into legal language. Patent writers should have a certain level of technical knowledge, so they should take courses related to the subject matter when they are undergraduate or graduate students.

2. Understand the patent prosecution process

To draft a good patent application, patent writers must understand the patent system well. They should understand patent requirements and the structure and organization of patent applications.

To request patent rights for an invention, the invention must be new, useful, and nonobvious. First of all, if there is "a prior art", inventors are not able to get patent rights. This is a very simple rule. When someone creates a product which already exists, this is not an invention.

Second, an invention has to be “a useful art.” For example, when an inventor developed an energy efficient car engine technology, this is a patentable subject matter. However, when an inventor developed an efficient weapon to kill people, this is not a patentable subject matter. This is because an efficient instrument to kill people is not useful for the general public. Third, an invention has to be a nonobvious matter. If an invention doesn’t contain any technological improvements, this would not be a patentable subject matter meaning that if the invention is one of ordinary skills in the field, it is not a patentable subject matter.

In addition to understanding patentable subject matters, patent writers have to know all the sub-sections of patent applications. A patent application is made up of title, abstract, drawings, field of invention, prior art, objects of invention, consistency clauses, description of drawings, specific description, and claims.

3. Read patent applications written by well-known companies in your field

After understanding the patent system, prospective patent writers should read well written patent documents to observe the techniques of other writers. To select good patent documents, patent applications submitted by the world leading companies in your field are likely the best places to start. These companies hire experienced patent writers and lawyers. They draft patent applications and revise them carefully so their patent documents should contain useful and valuable expressions to request patent rights.

4. Practice patent application drafting

The next step is practicing. For any sort of professional writing, practice is a very important activity. Patent application drafting is the same. Two methods are advised. First, prospective patent writers should read patent documents and rewrite them. This allows fledgling patent writers to memorize the structure of patent applications. Second, prospective patent writers can begin to understand the concept of an invention by reading a patent document. Then, they can start to convert the subject matter of the invention into their own expressions. This helps them to improve their patent drafting skills.

5. Review and Request feedback from experts

If possible, prospective patent writers should ask other experts to review their writings to get feedback. Experts have their own insight so they are in a position to highlight the good aspects and weaknesses of the patent writings and then could provide recommendations. This allows prospective patent writers to understand their shortcomings and improve them.

Patent Drafting Guideline

Claim Drafting

Patent claims establish the boundaries or scope of an invention. (Stim, 2014) When a copycat made, used, or sold an invention, the patent right owner would be able to sue the copycat. The court compares the invention described in patent claims with every component of the copied product to make a decision. Thus, patent claims are the most important section in a patent application.

This section provides representative patent claim drafting methods in the Software invention field and provides the best practices.

Beauregard Claim

A Beauregard claim is a computer-readable medium claim. Beauregard claims cover computer storage devices which contain a set of computer instructions that make a computer perform a designed function. In the past, a set of computer instructions to perform a certain process was not patentable because these instructions were considered a written document and not an invented object. Figure 6 is an example of a set of computer instructions. Computer programmers and developers write this computer software program using computer programming language. Then, computers interpret and process this computer software program written in computer programming languages. The court viewed this as a set of instructions written down on paper, denying that it is a manufactured product and a patentable subject

matter.

```

MatrixC MatrixC::operator+(MatrixC added)
{
    if (this->RowSize != added.GetRowSize() ||
        this->ColSize != added.GetColSize()) {
        exit(0);
    }
    MatrixC result(this->RowSize, this->ColSize);

    for (USHORT r = 1; r <= result.GetRowSize(); r++) {
        for (USHORT c = 1; c <= result.GetColSize(); c++) {
            result.data[r][c] = this->data[r][c] + added.data[r][c];
        }
    }
    return result;
}

```

Figure 6. An example of a set of computer instructions

However, from the mid-1990s, the court started to view a set of computer instructions stored in a computer-readable storage device such as a floppy disk, a hard disk drive, and a flash memory drive as **an article of manufacture**, making it patentable. (Malhotra, 2007)

Since Beauregard claims allow patent writers to describe the software program invention directly, almost all software patent applications include this kind of claim.

Good Practice:

17. One or more **non-transitory computer-readable media** having **computer executable code** stored thereon, the code comprising:

a routine executable to display a slide bar with three discrete positions and no intermediate positions there between, wherein the three discrete positions comprise a

payment confirmation position disposed at a first end of the slide bar, a decline position disposed at a second end of the slide bar opposite of the first end, and an initial position disposed on the slide bar between the payment confirmation position and the decline position, wherein the slide bar can be swiped from the initial position to a payment confirmation position and from the initial position to the decline position;

a routine executable to confirm a payment when the graphical element is moved to the confirmation position.

(Casey, 2012)

This is an example of a Beauregard claim for motion-based payment confirmation. The invention is comprised of two parts. Each part is a set of computer instructions. The first set features a slide bar on the display unit of the target device. Then, the device senses a motion gesture input from a user by monitoring the movement of the said slide bar. When the slide bar is moved to the confirm position, the second set of computer instructions confirms the position of the slide bar and proceeds to the payment process.

This claim is good because of the two reasons mentioned below.

- ① There are only two components which comprise the invention.

When the court makes an infringement decision, it compares each component in the patent claim with a component in a copycat. Few components in the patent claim help the court compare components easily, so it is easier to draw an infringement decision

from the court.

- ② The first component contains only three essential units for the payment.

This claim contains three locations for motion – initial position, decline position, and confirm position. These positions are essential for the payment process. Therefore, it is almost impossible to invent a copycat without including three locations. If a copycat also had these three positions in its implementation, it would be a clear infringement.

How to write a Beauregard claim:

One or more **non-transitory computer-readable media** having **computer executable code** stored thereon, the code comprising:

[Component A of the SW program] (further details of this SW component);

[Component B of the SW program] (further details of this SW component);

[Component C of the SW program] (further details of this SW component);

And so on.

To create a Beauregard claim, patent writers should identify essential components in the invented SW program. These components are elements in the claim. Then, they arrange SW components and write an additional description of each component. Basically, a SW component is a set of computer instructions and a separation unit to dissect a SW program. Patent writers

don't need to write all components in the independent claim. They should write essential components in the independent claim and write non-essential components into dependent claims.

System Claim

In general, all software programs are comprised of steps which perform a process. A system claim is to protect novel components that perform mandatory steps of the invented software program. Therefore, this system claim will protect essential and novel components of the invention.

When the court decides whether a competitor has infringed on the invention, the court compares the existence of all components in the patent claim to components in the copycat.

When the competitor divides components in the invention into two or more groups and implements two or more systems which work together as a single system to avoid infringement, the court decides it is an infringement. This is because the party must control a system as a whole and obtains benefit from it.

Because a system claim allows patent writers to describe novel components or modules in the invention all software patent applications have these types of claims.

Good Practice:

1. A **system** comprising:

an image receiver configured to receive a digital image, including time of capture of the

digital image corresponding to a preset time zone;

a location receiver configured to receive location information identifying a location, including time of recording of the location information corresponding to a reference time zone;

a comparison unit configured to compare the preset time zone with the reference time zone; and

a processor operatively coupled to the image receiver and the location receiver, the processor configured to detect an assignment of the digital image to the location; and

generate an indication of a time zone conflict, responsive to the comparison by the comparison unit.

(Bhatt, 2013)

This example claim is a software program for adjusting time metadata of digital media items. When the time of capture of the digital image is in a preset time zone that is different from the time zone of the location, the user of this capturing device will receive a notification about time zone conflict.

This invented system is comprised of four components. The first component acquires an image and a preset zone time. The second component acquires the location. The third component compares the preset zone time with the local time. The fourth component detects any difference and provides a notification where there is a time discrepancy.

This claim is good because the purpose of each component in the claim is clear. Patent writers who drafted this claim clearly defined the purpose of each component. This helps judges understand this claim clearly and able to compare all components in this claim with components in a copycat, enabling the inventors to get an infringement decision from the court, preventing competitors from creating copycats.

How to draft a System claim:

A system for [the invented product] comprising:

[Element A] (further details of this element);

[Element B] (further details of this element);

[Element C] (further details of this element);

And so on.

The structure of a system claim is simple. First of all, identify essential elements of the invention. If there are non-essential elements, patent writers shouldn't place them in an independent claim as this could narrow the scope of the invention. In addition, patent writers should use general terminology. If they used their own lingo and other competitors used different terminology, the court could decide that they are not using the same terminology and the competitors are not infringing on the invention.

Method Claim

A software program has a process to achieve certain goals, comprised of steps. Method claims include active steps in a process to define the invention. A process has to be unique or better than the prior arts.

Each element in a claim uses verb + “-ing” form. This element represents an active step in a process. So, a method claim is a set of steps in verb + “-ing” forms.

When the court decides whether a competitor has infringed on the invention, the court compares the existence of all steps in the method claim to steps in the copycat. When there are too many steps in a claim, it is easy for competitors to stall the existing patent claim by omitting one or two steps in the claim. Therefore, it is very important to identify important (and essential) steps in the process of the invented software program and draft a claim based on only such essential steps. Other unessential steps will be included in other independent claims.

Good Practice:

1. A **method** for providing a user With contextual information for at least one alarm received from a transmitting electronic device, Wherein a receiving electronic device is configured to be in communication with the transmitting electronic device, Wherein an alarm date and an alarm time are associated with the at least one alarm, comprising of:

receiving the at least one alarm from the transmitting electronic device;

parsing the at least one alarm;

automatically **matching** the at least one alarm to an alarm

template;

storing the at least one alarm on the receiving electronic device with the matched alarm template; and

outputting the contextual information from the alarm template matched with the at least one alarm at the alarm date and alarm time.

(Bull, 2012)

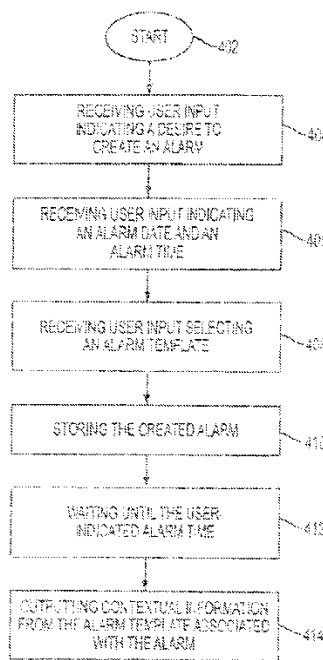


FIG. 4

Figure 7. An Example of a Patent Flow Chart (Bull, 2012)

Figure 7 is a flow chart describing the main process of this invented software program. As you can see, this invention is comprised of element steps of the invented process. The claim is

including and describing exactly the same process in this flow chart.

This example claim is a software program for providing an alarm with contextual information. In other words, when a user receives an alarm, the system also provides related information about it. For example, when a user receives an alarm, the system shows text or images related to this alarm. Therefore, the user is able to identify why the system has presented an alarm .

This claim is good because of the two reasons mentioned below.

- ① The purpose of each step in the claim is clear and essential.

This claim has five steps. They are all essential steps to achieve the goal of this invention. Other competitors are not able to create the same software program without these five steps.

- ② This claim doesn't include unessential steps, like independent claims do.

When patent writers want to include non-essential steps into a claim, they would be able to combine the independent claim with a dependent claim to create a more specific claim. Patent writers do this to avoid other prior arts.

How to draft a Method claim:

A **method** for [the invented product] comprising:

[Step A of the SW program] (further details of the step A);

[Step B of the SW program] (further details of the step B);

[Step C of the SW program] (further details of the step C);

And so on.

To write a method claim, the first step is to identify steps detailing the process of the invention. Software programs consist of steps. A computer follows these steps to complete a process and output the expected result – data or information. Similar to other claim types, patent writers should identify essential steps in the invented process. They don't need to state non-essential steps in the independent claim. Instead, they should be able to state these non-essential steps on dependent claims.

Embodiment Drafting

Embodiment by definition is a manner in which an invention can be made, used, practiced or expressed. (Bellis, 2014) In a patent application, possible examples of the concept of the invention are given to explain different embodiments. The primary purpose of these examples is to explain the feasibility of the invention and to demonstrate significant unexpected improvement from prior arts. (Shao, 2014) Therefore, the embodiment section in a patent application has to contain a detailed description of all possible products and practices of the invention. Moreover, after reading the embodiment section of a patent application, other engineers in the same field should be able to implement the same product and practice the same process. When this embodiment is not specific enough for others such as patent officers, the patent application will be rejected because patent officers base the feasibility of the invention on the embodiment section.

In addition, patent officers and judges will decide the scope of the invention by evaluating claims in a patent application. The embodiment describes detailed possible implementations of the invention and supports claims. Therefore, the scope of the embodiment is very important to determine the scope of the invention, making it very important to write all possible embodiments to broaden the scope of the invention and to request stronger patent rights.

This section provides representative devices in the Software invention field and provides the best practices for embodiments for these devices.

- Smart phone & Tablet: These devices are the most popular contemporary mobile devices.
- Television: Almost all contemporary devices contain a display unit. Therefore, technologies related to television are important because such technologies are applicable to other devices.
- Camera & Camcorder: a smartphone and a tablet include two cameras – back and front - and the quality of image is a one of the most important factors to evaluate a smartphone or a tablet. The most popularly used online services such as Facebook and Instagram are based on camera and camcorder technologies, making these software technologies one of the most important technologies for contemporary mobile devices.
- Health Equipment: Personal mobile health equipment is an emerging business area and many software companies are focusing on this field.

Smart phone & Tablet

Convergence

Nowadays, smartphones and tablets are very important devices. Smartphones, including tablets, overlap with other electronic devices such as cell phones, personal computers, organizers, televisions, cameras, camcorders, mp3 players, and portable gaming consoles. (See Figure 8)

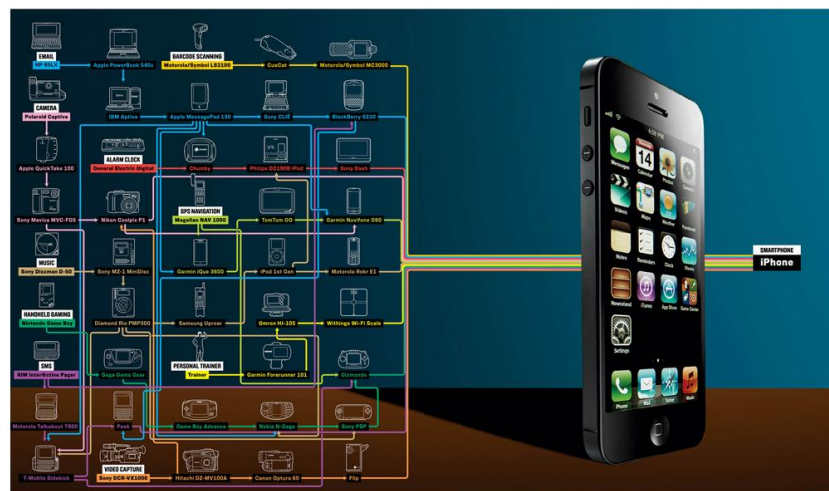


Figure 8. How Over 40 Gadgets Converge Into the Tiny Device in Your Pocket (Russell, 2013)

Because these devices are all connected, when patent writers and inventors write smartphone related inventions, they should expand their definitions of the inventions to cover these devices. Therefore, patent writers should use the expression “a mobile communication device” to cover all possible communication devices. Patent writers could use “an image capturing device” to cover a camera and camcorder. This is a good expression that could cover televisions and other video related devices.

Recommendations and Sharing

Smartphones and tablets have both communication ability and a high performance processor. To expand an invention and gain stronger patent rights, patent writers and inventors need to think outside the box.

Recommendation: Patent writers and inventors are able to add location based features to their initial invention. For example, if the invention were a music player, they could add location based recommendations to their initial concept. In addition, they could add other features – user profile, weather and mood - to recommend music to users. By adding recommendation features to user inventions, a variety of embodiments is possible, making it a stronger case.

Sharing: Patent writers and inventors are able to expand their inventions by adding sharing features to it. Because of the communication ability of mobile devices and affordability of wireless network cost, sharing contents with peers and other devices is the most popular application.

Television

For a television related invention, it is possible to expand the concept of the invention to all devices containing a display unit such as LCD (Liquid-Crystal Display), OLED (Organic Light-Emitting Diode), and CRT (Cathode Ray Tube). The number of television viewers is decreasing. More people are using smart phones, tablets, and personal computers to watch video contents because these devices are easy to carry and provide interactive services. If the invention only covered “Television”, its impact on the market would not be big enough. Thus, inventors and

patent writers have to consider that their inventions could be applied to other devices having display units and expand their inventions to such devices.

Communication

Recently, several television manufacturers have released “Smart TVs” which are able to access the Internet and provide interactive applications to users. However, the market impact is not big enough because users already have convenient communication devices so this feature on the TV is not especially desired. As a result, when inventors and patent writers limit the invention to only televisions, the concept becomes available to manufacturers of tablets and smartphones since the patent doesn’t include these devices. Thus, when an invention is related to televisions, inventors and patent writers have to consider whether a television could possibly have communication capability. This way of thinking will create additional implementations of the invention that should cover not only televisions but also smartphones and tablets.

Cameras & Camcorders

Image Capturing Device: Patent writers and inventors don’t describe their inventions as “Camera” or “Camcorder” because this limits the scope of their inventions. Because of convergence and semiconductor technologies, the digital image sensor such as CMOS (Complimentary Metal Oxide Semiconductor) is tiny and other electronic devices such as smartphones, tablets, personal computers (laptops), and televisions include one or more cameras to acquire and share images. When an invention uses “camera” to define itself, the scope of this invention is limited to only camera. This is not a good strategy because other

device manufacturers could use this invention without paying royalties if they manufactured not a camera but a smartphone, tablet, and so on. To cover all possible devices mentioned here and request stronger patent rights, patent writers and inventors should use “image capturing device” or “image acquiring device” instead of “camera” or “camcorder.”

Communication

Nowadays, the biggest camera competitor is the smartphone. Smartphones are easy to carry and have communication capability. This lets people share their photos and has been instrumental in promoting SNS (Social Networking Service). As a result, the size of the market for the camera business is decreasing. However, since a camera is equipped with a high imaging sensor and is able to produce higher quality photos, many people still prefer cameras. Figure 9 compares the image sensor size of the iPhone and a popular DSLR (Digital Single-Lens Reflex) camera. The small, left-most box is an iPhone image sensor and the right-most box is a DSLR sensor. Because of this larger sensor, photos taken by a DSLR are always of better quality.

To compete against smartphones and expand the scope of an invention, patent writers and inventors could add communication ability to their camera related inventions. They could write additional implementations related to sharing photos with other people and other devices. This would help them to create stronger patent rights.



Figure 9. Sensor Size: A Relative Size Comparison Tool for Camera Sensors (Zhang, 2012)

Health Equipment

Connectivity: Improved sensor technology has allowed device manufacturers to create tiny and cheap health devices. This will most certainly create a new huge market, so many electronic giants are trying to get a foot in the door. Mobile device companies such as Apple are also trying to provide health devices by connecting health devices with their mobile devices – iPhone and iPad – to create a variety of inventions. Figure 10 is an example of connectivity – iPhone and sensing device. The sensor monitors user activities including biometric data and send this information to the connected iPhone or iPad. This monitored information can be used to check a user’s health status. Therefore, patent writers who write health device related inventions have to consider convergence scenarios between health devices and mobile devices. This will create various new embodiments for the invention and helps to strengthen patent rights.

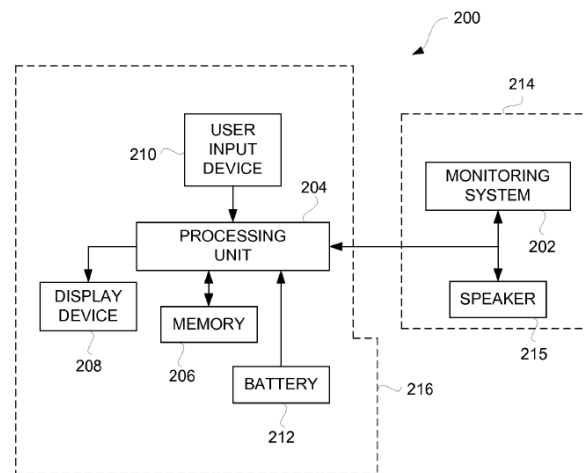


Figure 10. Sports monitoring system for headphones, earbuds and/or headsets (Prest, 2008)

Diagram Drafting

A patent application has to include at least one patent drawing. All patent drafting agencies hire designers who draw diagrams in patent applications. Patent writers draw rough drafts and designers then create very formal and professional diagrams. Therefore, patent writers have to understand why diagrams are important and what diagrams are the best for software related inventions. Helping readers to understand the invention and supporting the invention description are the most important reasons to include diagrams in patent applications.

Drawings help readers understand the invention: A picture is worth a thousand words. Sometimes, patent readers prefer diagrams to writings because it might be easier to interpret diagrams than read text in order to understand the invention. Readers might also have a more clear understanding of relationships among components comprising the invention. Therefore, understandable diagrams help patent officers understand the invention itself and feasibility of the invention, so this may allow a patent a smoother passage.

When patent writers omit a writing requirement, drawings could substitute for it:

Diagrams in a patent application have to include all components mentioned in the invention claims. This allows patent writers to confirm that they have included all components in the application. If patent writers accidentally omit a component of the invention and it is shown in the diagram, it is okay.

Composition Diagram

A composition diagram is the most common diagram type for a patent application. This diagram

includes all components comprising the invention. For example, software related products always have at least one processor unit, one storage unit, one memory unit, input port unit, output port unit, and a display unit. In addition, each product also includes particular hardware components which represent the main functionalities. For example, the two most important differences between a smartphone and a personal computer are sensors and communication ability. Smartphone and tablet related inventions have to contain such sensor and communication components. After including these hardware components, diagrams have to include all software components stated in the claims.

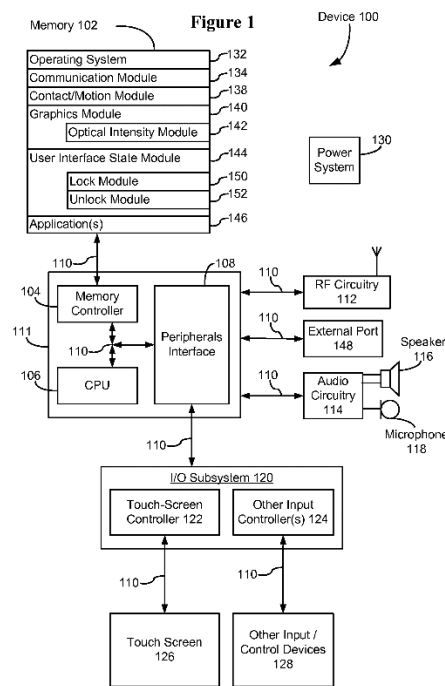


Figure 11. Internal Structure to Implement "Slide to Unlock" (Apple, 2009)

Figure 11 is a good example of a composition diagram. This diagram is comprised of hardware

components and software components. Although the hardware composition is simplified, it includes all essential hardware components. Software composition includes all essential software components, so it is easy to identify important components and interactions among them. This helps patent officers and other engineers understand this invention easily. In addition, the quality of this diagram is high, so readers are able to examine every detail. Sometimes, the quality of a diagram is poor, so readers cannot get all the details.

Flowchart

The easiest method to explain a software program is a flowchart. Technically, a software program is a set of computer instructions and the computer executes one order on this set at a time. This creates an execution flow of instructions. Therefore, the best way to understand a software program is to understand this control flow so almost all software patents include at least one flow chart.

Figure 12 is a good example of a flowchart. This flow chart is good for two reasons. First of all, good flowcharts in patent applications should be simple and clear, so they are easy to understand. If patent officers are not able to understand your invention, they won't be able to evaluate it, and thus they won't give you patent rights. Therefore, patent writers and inventors need to identify essential steps for their invention and create an understandable flowchart using comprehensive language expressions. Second, this diagram must contain all components mentioned in the first claim of this invention. Each box in this flowchart represents each element in the first claim. This is important because patent officers would be able to confirm

claim elements from this flowchart.

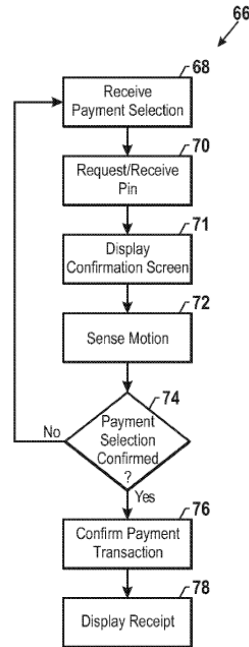


Figure 12. A Flow Chart Example (Casey, 2012)

User Interface Diagram

Nowadays, UI (User Interface) technology is a very important technology. Since the hardware performance of electronic devices has become universally similar, people are starting to select electronic devices based on the quality of their user interface, creating competition in the software field. "Slide to Unlock" created by Apple is the best example. This UI technology provided a very intuitive interface to secure the iPhone. (Chaudhri, 2009) Other software manufacturers such as Google are not able to use this intuitive technology for Android because

this is protected by the patent system. Figure 13 is the main diagram from the patent document of this UI technology. This diagram is good because patent officers are able to intuitively understand the purpose of this invention and figure out the difference between other previous technologies and this technology.

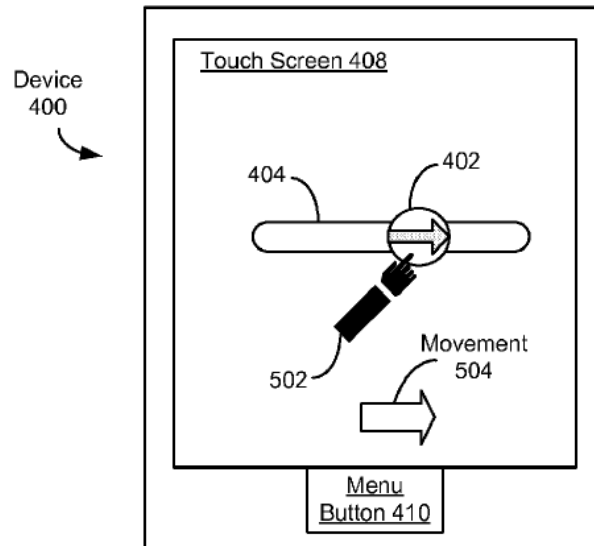


Figure 13. User Interface Diagram of "Slide to Unlock" (Apple, 2009)

Terminology Definition

1. USPTO: United States Patent and Trademark Office
2. Prior Art: *All information that has been made available to the public in any form before a given date that might be relevant to a patent's claims of originality* (Wikipedia, 2014)
3. Embodiment: *Inventions can take the form of many embodiments. Each embodiment is a manner in which an invention can be made, used, practiced or expressed.* (Patenthome, 2014)

Reference

- Bellis, Mary. (2014). Definition: Embodiment. Retrieved Mar 7, 2014, from <http://inventors.about.com/od/definations/g/embodiment.htm>
- Bhatt, Nikhil. (2013). US8542294B2. Apple. Inc.
- Bull, William. (2012). U.S.A. Patent No. US8437225B2. Apple. Inc.
- Casey, Brandon J. (2012). U.S.A. Patent No. US8364590B1. Apple. Inc.
- Chaudhri, Imran. (2009). U.S.A. Patent No. US8046721B2. Apple Inc.
- Malhotra, Deepak. (2007, Feb 19 2007). In re Beauregard, 1995. Retrieved Mar 28, 2014, from <http://patentsusa.blogspot.com/2007/02/in-re-beauregard-1995.html>
- Oppenheimer, Steven. (2008). Patent Careers for Technical Writers, Engineers, Scientists, and Medical Professionals. http://www.ebstc.org/newsletter/0908/Article_2.htm
- Patenthome. (2014). Embodiment. Retrieved Mar 15, 2014, from <http://patenthome.com/patent-terms>
- Prest, Christopher. (2008). U.S.A. Patent No. US8655004B2. Apple. Inc.
- Russell, Terrence. (2013, Apr 16 2013). How Over 40 Gadgets Converge Into the Tiny Device in Your Pocket. Retrieved Mar 7, 2014, from <http://www.wired.com/magazine/2013/04/convergence/>
- Salary.com. (2014). Patent Agent II - U.S. National Averages. Retrieved Mar 7, 2014, from <http://www1.salary.com/Patent-Agent-II-Salary.html>
- Shao, Lin. (2014). How to Draft a Patent. Retrieved Mar 7, 2014, from <http://beamlab.tamu.edu/Writing%20Tips/Dr.%20Shao/How%20to%20draft%20a%20patent.html>
- Stim, Rich. (2014). Patent Claims: The Basics. Retrieved Mar 28, 2014, from

<http://www.nolo.com/legal-encyclopedia/patent-claims-the-basics.html>

Soy, Sue. (1997). The Case Study as a Research Method. Retrieved Mar 7, 2014, from <https://www.ischool.utexas.edu/~ssoy/usesusers/l391d1b.htm>

U.S. Bureau of Labor Statistics. (2014). Occupational outlook handbook. Retrieved Mar 7, 2014, from <http://www.bls.gov/ooh/media-and-communication/technical-writers.htm>

Wikipedia. (2014, Feb 3). Prior art. Retrieved Mar 15, 2014, from http://en.wikipedia.org/wiki/Prior_art

Zhang, Michael. (2012). Sensor Size: A Relative Size Comparison Tool for Camera Sensors. Retrieved Mar 7, 2014, from <http://petapixel.com/2012/07/16/sensor-size-a-relative-size-comparison-tool-for-camera-sensors/>

Appendix

Interview Question

General Question

1. What is your job title in your company?
2. What are typical tasks that you do in your job?
3. Describe your education – undergraduate major, graduate major, and so on.

How to become a patent writer

4. Do you think patent writing is a promising job for a technical writing student? Why or why not?
5. Describe the steps to become a patent writer.
6. What skills are the most useful to become a patent writer?

How to draft a good software patent application

7. Select the three or four most important sections. Why?
For example, the claim, diagram, and embodiment sections are important because ...
8. What skills are the most important to draft a good software patent application? Why?
9. What kinds of information should be added to this software patent drafting guideline? Why?

Interview Result – Interviewee #1

1. What is your job title in your company?

Patent Engineer

2. What are typical tasks that you do in your job?

Patent strategy planning, patent application review, Patent map

3. Describe your education – undergraduate major, graduate major, and so on. Graduate

4. Do you think patent writing is a promising job for a technical writing student? Why or why not?

In the USA, patent agents and patent lawyers are only able to draft a patent application because the American government regulates this. In addition, patent drafting requires good writing skills, technical knowledge, and legal knowledge. Therefore, I can't say a good technical writer is a good patent writer. A patent writer needs to train for all three skills – writing skills, technical knowledge, and legal knowledge. However, I agree with you that patent writing is a promising field. This is true.

5. Describe the steps to become a patent writer.

Engineering Background -> Technical writing -> Patent law (agent, lawyer)

6. What skills are the most useful to become a patent writer?

Three skills I mentioned above are the most important skills. Among them, technical knowledge is the most important.

7. Select the three or four most important sections. Why?

The claim section is the most important. Although Claim is the most important section in a Patent application (claimed invention), Embodiment should support claims. Therefore, embodiment section is also important.

8. What skills are the most important to draft a good software patent application? Why?

I think technical knowledge is the most important skill. This is because technical understanding of the invention and related products is crucial to drafting a software patent application and prove infringement.

9. What kinds of information should be added to this software patent drafting guideline? Why?

Importance of technical knowledge

Interview Result – Interviewee #2

1. What is your job title in your company?

A. Senior engineer

2. What are typical tasks that you do in your job?

A. To produce patent applications: I review ideas collected from inventors and convey them to patent attorneys to write patent applications. I review the applications and submit them to patent offices.

B. To analyze patents applications from other companies: I review patent applications that are on the public domain to examine and find out what technologies other companies focus on.

3. Describe your education – undergraduate major, graduate major, and so on.

A. B.S.E in Electrical Engineering / B.S. in Computer Science (Double major)

B. M.S in Electrical Engineering

4. Do you think patent writing is a promising job for a technical writing student? Why or why not?

- A. I think that it is a promising job because the demand to produce well-written patent applications are increasing continuously. However, the patent writing requires writers to have deep knowledge on technical subject matters. So, if you want to devote yourself to becoming a patent writer, you should know that you have to study technical knowledge.
5. Describe the steps to become a patent writer.
- A. There are various ways to become a patent writer. In the U.S., becoming a patent agent is the most effective way to be a patent writer. To become a patent agent, you should study a patent agent exam and pass it. Another way to become a patent writer is getting a job in a patent law firm. Many law firms hire patent writers and drafters.
6. What skills are the most useful to become a patent writer?
- A. Writing skill is the most important for a patent writer because one of the main jobs of a patent writer is to write an invention based on an inventor's idea. The patent writer should be capable of producing a clear patent application that claims the inventor's right. To make a patent application clear is not an easy job. It requires ceaseless efforts and long work experience.
7. Select the three or four most important sections. Why?
- For example, the claim, diagram, and embodiment sections are important because ...
- The claim section is the most important because it claims the right of the patent application.
- The embodiment section is important because it can be used to interpret the claim section.
- The diagram section is important because it helps readers understand the invention very effectively.
8. What skills are the most important to draft a good software patent application? Why?
- A. Software itself is not patentable. Thus, a description of how a device works with the

software is very important

9. What kinds of information should be added to this software patent drafting guideline? Why?
 - A. If a real example is given to the readers, it would be very helpful. For example, how to write a patent application about a software program such as Photoshop.

Target Audience

This guideline is for technical writers, inventors, and students who want to become a patent writer or need to draft a patent application. This guideline provides three representative personae of the target audience to help readers understand the purpose of this guideline.

Personae include a software writer, an inventor, and a technical communication student. Each persona describes why he or she uses this guideline and how to use this guideline.

1. Software Patent Writers

Patent application drafting requires the use of specialized language expressions in the patent field to make more explicit patent applications and thus get better protection. Patent writers usually have their own inventories which contain examples of the use of specialized language expressions. However, these personal inventories come from personal knowledge and depend on insufficient patent analysis. Thus, this guideline will replace personal patent drafting inventories.

Persona: A patent writer who has a technical writing and engineering background



Dana is a 30 year old patent writer who works at Samsung Headquarters in Korea. She previously had a job writing electronic hardware patent applications, so she is good at patent application drafting. Recently, she was thinking about her future career and realizes that major Korean companies and the Korean government are focusing on the “Software” business. Therefore, she was considering a career as a software patent writer in the future. The company also offered various software patent writer positions, so she was able to change her role and stay in the company.

Scenario: She searches for information about software patent application drafting. She searches for guidelines and detailed examples. As a result, she visits my website. At the beginning, she tries to find claim drafting examples because claim is the most important part to define patent rights when she drafts a patent application. She uses the main menu bar on the top of my website to navigate it. She looks for the term “Claim Drafting” or “Claim Example” to find claim types and examples. She is able to find her target page easily and reads the detailed information. She is able to find claim types and examples with detailed explanations. The webpage also provides pros and cons of each example. Therefore, she is able to compare them and find the best one for her concurrent drafting.

Image Source: <http://www.freedigitalphotos.net/images/cheerful-attractive-girl-working-on-laptop-photo-p184012>

2. Inventors in Software Industry (Developers, Researchers, and Students)

Inventors must understand the detailed characteristics of Software patent application practices to protect their own inventions.

Persona: Software Developer

Sherry is a 35 year old software developer who works for a small IT company in Minnesota. She is developing a software program for Android software platform. Recently, she invented a better user interface. She wants to protect her invention by demanding patent rights. The company assigned a patent writer who will write a patent application.

Scenario: Her main interest is to create a more convenient user interface for locking and unlocking smartphones. Recently, she invented a new and better user interface to lock and unlock smartphones. Since the patent writer will draft a patent application for her, she needs to express her invention clearly to the patent writer. However, because of a lack of understanding of the patent system, she is not able to communicate with the patent writer well. The company will provide incentives when she submits the patent application to USPTO (United States Patent and Trademark Office). Therefore, she is looking for a quick reference guide for software patent application drafting and visits my website. She wants to draft a main diagram which describes the internal structure of the invented software system, so she is looking for “diagram drafting” from the website. When she finds a page which contains diagram examples for software inventions, she realizes that this website provides the information she needs. The website contains representative examples of contemporary software and hardware visualizations from the top three IT companies – Apple, Google, and Microsoft. Although she doesn’t have a patent background, she is able to draft a diagram for her invention. She will use this diagram to explain her invention to the patent writer. In addition, the patent writer will improve on this diagram and use it as the main diagram in the patent application.

Image Source: http://www.freeditphotos.net/images/Emotions_g96-Frustrated_Woman_p81433.html

3. Technical communication students

A patent writing job is a good opportunity for students who study technical communication.

Students may want to study patent application drafting skills to prepare for their future.

Persona: Graduate Student in Technical Communication



Brian is a 25 year old graduate student working toward a master's degree in technical communication. He is searching for a job. Although he knows about traditional job positions for technical writers, he is looking for a more specialized technical writing job position because he believes that specialized writing positions may lead to a brighter and more stable future. Recently, he read a new article about patent lawsuits related to Apple and

Samsung. He thinks patent writing could be a good career choice because it requires not only good writing skills but also legal knowledge.

Scenario: Brian is looking for some basic information about the patent application drafting process because he wants to be a patent application writer and is unfamiliar with this field. He visits the law library at the University of Minnesota to find resources. However, he realizes that all patent drafting books are too thick and difficult to read so he looks for brief and easy materials. At the beginning, he searches for patent writers using the LinkedIn search function. He visits my LinkedIn profile page and reads my profile and then visits my guideline website to acquire further information. When he connects to my website, he glances at the main menu

items on the top. Then, he clicks on “how to become a patent writer.” After reading this webpage, he wants to read examples of patent application drafting. He uses a search form on the website to find examples and reaches the “claim types and examples” webpage. He reads each claim type carefully and thinks this website is good to get initial knowledge about patent application drafting. Finally, he adds this website to his bookmarks for future reference.

Image Source: http://www.freedigitalphotos.net/images/Learning_g376-College_Student_Holding_Notebook_p104950.html