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### The New Thaipography

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***Rochester Institute of Technology***

A Thesis submitted to the Faculty of  
the College of Imaging Arts and Sciences  
in Candidacy for the Degree of  
***Master of Fine Arts***

***The New Thaipography***

by Chotima Vongviriyatham  
May 22, 1997

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Signature \_\_\_\_\_

Date *20 May 1997*

***Dedicated to***

Every Thai Designer

***Special Thanks***

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## ***Introduction***

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This thesis is about designing a new Thai typeface. The project attempts to increase Thai typefaces options for Thai designers. The range of existing Thai typeface selection is limited, for use in text and display situations. There are several problems of Thai typeface usage at both the display and text type level. This project focuses primarily on the development of a new typeface for use in display situations.

Thai designers use a single typeface for a wide range of products without regard for the differences between the products. Through attempting to solve the problem of limited options, this project includes a comprehensive study of Western typographic theories and principles and the application of these toward the new typeface design. Therefore, this project begins with research and analysis to understand the historical evolution of Western and Thai typography. The Synthesis section of this study relates to the way designers order and interrelate information from research through the design process. Ideation, Evaluation and Implementation sections are focused on two areas: 1) the development of a new typeface and 2) the application of this typeface to a series of promotional posters. The typeface ideation has been evaluated by Thais. The evaluation stage was an important and useful part of the process to understand the many considerations that must be satisfied in the design of an effective typeface. The goal of the new typeface design, or 'the New Thaipography,' is to provide a new typeface choice for Thai designers that functions well in display situations and has aesthetic integrity.

## ***Thesis Project Definition***

---

Contemporary Western graphic design continues to be dramatically affected by digital technology, the speed with which messages and images are transmitted, and its influence on society and communication. This new technology has also added increased flexibility in the field of typographic design.

In spite of this, typographic design in Thailand has been developing slowly, especially in the development of display typefaces. For example, there are few display typefaces for use in visually communicating products related to 'contemporary design' and advanced technology (in this project *contemporary* means new or temporarily in vogue, such as contemporary clothes, art books, etc). The design of a new display typeface would be useful in offering expanded choice and saving the time and money associated with designing a special typeface for individual projects as they occur.

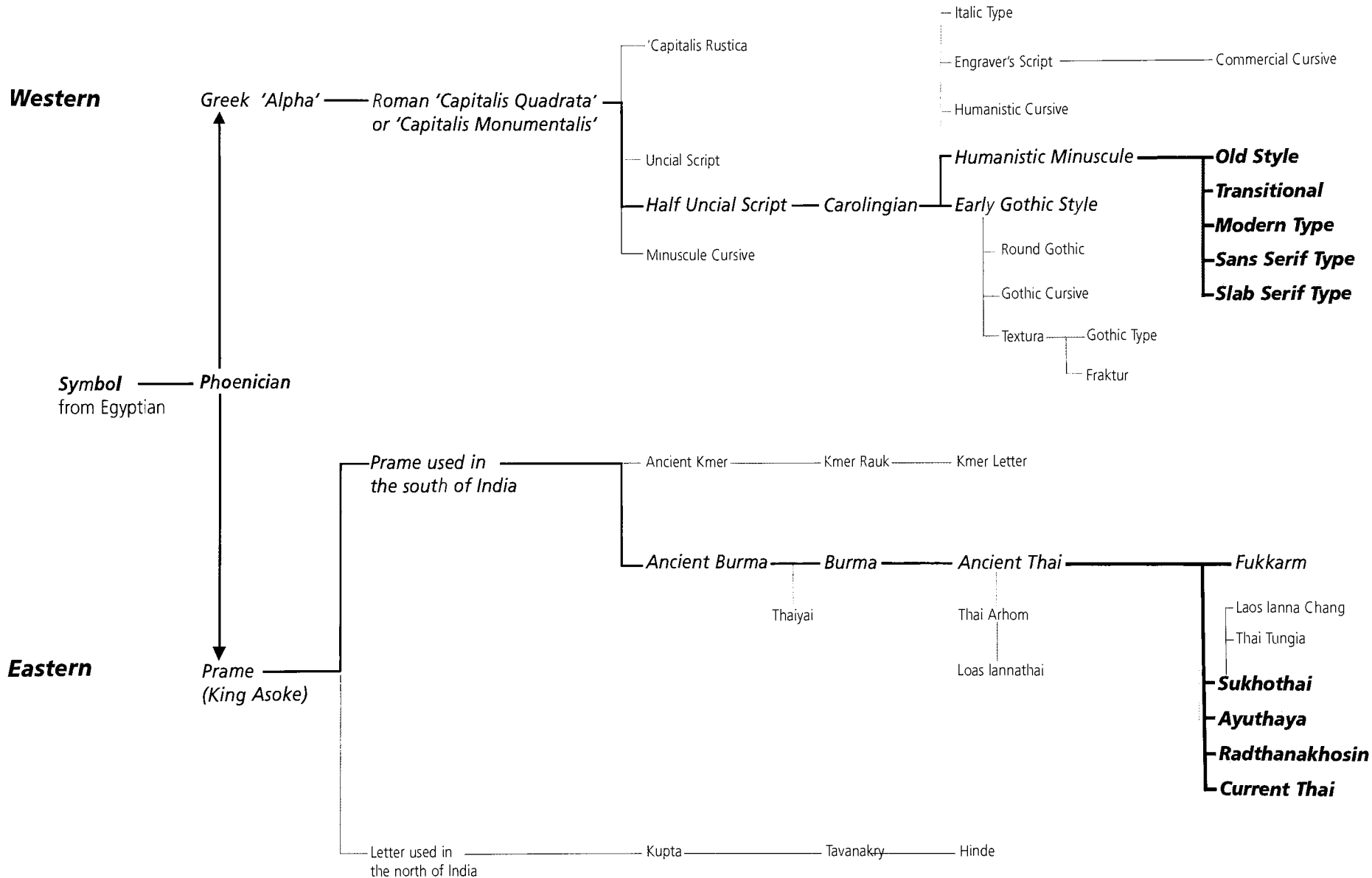
*This thesis attempts to meet several needs:*

- 1 To expand options for the Thai designer by creating a typeface for use in visually communicating messages related to fashion or advanced technology.
- 2 To explain that typography reflects a specific time period. As time changes, typeface style also changes and develops.
- 3 To apply Western principles and theories to the design process. This analytical approach yields a new typeface that embodies the best characteristics of these principles and theories.
- 4 To introduce the Thai letterforms to other cultures.

## ***Research and Analysis***

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Research and Analysis  
**The Evolution of Letters**



### **History of Western Typefaces: Cultural Influence Period**

---

We use symbols to express our thoughts, feelings and ideas. Humans have developed and used characters for thousands of years. Gradually, they have succeeded in designing and composing alphabets for standard communication by means of the written word.

Cave paintings found in southern Europe tell us stories which are more than 30,000 years old. Egyptians passed on messages with *hieroglyphics*, drawings with symbolic meaning.

#### **12th Century BC**

The alphabet was developed by Phoenicians. Since Phoenicians travelled a great distance for their business, the alphabet was propagated. This followed by a flourishing culture around the Mediterranean Sea. Eventually, Phoenicians changed the drawings to a set of characters.

Phoenicians' alphabet was adapted by the Greeks. They changed the characters slightly and called them '*alpha*'.

The Romans learned the alphabet from the Greeks and developed the characters to shapes. Greeks carved the characters on their buildings. Roman emperors used them to emphasize their power and to distinguish their culture from others. For example, Forum Trajanum in Rome, was erected by the Emperor Trajan himself in 114 AD, shows the characters which tell the stories of the triumphs of the Roman empire, through seafaring, trade craftsmanship. The inscription was considered to be a splendid example of the Roman letter carving art. The script on Trajan's column is called '*Capitalis Quadrata* or *Capitalis Monumentalis*.' Each character fits exactly in a square. They revealed a dynamic liveliness and are constructed by using geometric forms. These characters have been the model of calligraphers from the Renaissance to our time. For example, the script used different sizes of capital height and increased spacing between characters, line lengths and x-heights. The characters were not all the same height. Rounded forms, such as O, C and G were made taller than straight forms such as I and E. In other cases, some characters were made wider or narrower, so they would optically match the same length of an individual word or line to complement the entire composition.

Monumental script was for the exclusive use by rulers, emperors and senators. In Pompeii, the paintings of *graffiti*\* dates from 79 AD. This graffiti was called *Capitalis Rustica*. It was written with a flat brush, so the characters clearly show obvious strong serifs. *Rustica* can be written slightly faster and was more generally used in books since it was written by hand, not through carving.



**History of Western Typefaces: Leadership Influence Period**

---

**5th -7th Century**

A transcript of the Roman author Virgil, in the Vatican Library, was written on parchment and calfskin. This edition of Virgil has also been written in *Capitalis Rustica* with the aid of a reed pen for a particular angle and emphasis on the vertical lines. *Rustica* was the script used in codex\* books up to the 7th Century. *Capitalis Monumentalis* and *Capitalis Rustica* were defined as formal hand-writing because of their easy reading and their beauty. However, it took a long time to write. Therefore, *Current Script* emerged. It could be written much faster. This style often became sloppy, with several character combinations in one pen stroke. In contrast to *Capitalis Script Styles* in which the character is equal height, certain characters of *Current Script* were given ascenders and descenders. These showed the beginning use of minuscules\*\*in the alphabet.

*Current Script* was also called *Uncial Script*. It was used in everyday life and by public servants, merchants and others who needed to communicate in writing. From the 5th to the 6th Century, it was used widely for codex script. *Uncial* has many soft, rounded shapes which made it an easier, more quickly written bookscript. Generally it was better suited for writing than *Rustica*.

A related form is the *Half Uncial*, which also has ascenders and descenders on some of the minuscules.

During the Great Migration, the Teutons (Scandinavians and Germans) migrated southward. The writing, with its roots in Uncial and Half Uncial script, was modified in individual regions of Europe. It gradually influenced the writing of the local people and local variations evolved; *Longobardian*, *Beneventan*, *Visigothic*, *Merovigian* and *Irish Half Uncial*. None of them are easy to read but they each have their own beauty.

**8th Century**

The politics in Europe had been achieved and stabilized. This time, Charlemagne had conquered most of Europe and wanted to reorganize his empire. As a result, written words started to actually have meaning. In 789 AD, Charlemagne decreed all Bibles and other liturgical literature by writing them in the official standard script, known as *Carolingian Minuscules*. The aim was to achieve a uniform interpretation of the Bible, which could be read and understood by everyone. Anglo Alquin Saxon was in charge of transcribing the Bible. This was of great importance to the later development of writing.

**13th Century**

During Europe's Middle Ages, Gothic style spread from northern France to central and northern Europe and replaced Romanesque. During the 12th-13th centuries, Carolingian minuscule became more sharp-edged in style than the original soft, rounded form.

\* Codex refers to the ancient manuscript text in book-form, not continuous roll.

\*\*Minuscules is an early term for small, or lowercase, letters.

**History of Western Typefaces: Gutenberg Influence Period**

---

**15th Century**

In 1450, Johann Gutenberg invented mobile metal type in Mainz, Germany. His challenge was to print mass quantities of a large book. In 15th Century Germany, the available technology was woodblock printing which was done by rubbing a burnisher over wet paper on a carved relief. This process is very expensive and time-consuming, and paper could be printed only on one side. He knew that metal coins were made by stamping gold with a metal die and personal seals could repeat the image. He combined the process of coin making and the reproducibility of the seals to his first form of typecasting and letterpress process<sup>1</sup>. The main feature was an adjustable mould. The mould contained dimensions of height, length and width which cast a character of the alphabet in relief.

In 1464, the art of printing started in Italy by two Germans, Conrad Schweynheim and Arnold Panartz. They learned the art from Fust and Peter Schöffer, and set up their printing press at the Benedictine Abbey Subiaco near Rome. Since script was easily understood by Italians, Schweynheim and Panartz were able to introduce the first printed Roman character in Italian. Later on, Nicholas Jenson, a Frenchman, worked as a printer in Venice and created a model of all Roman type. As a result, the development of printing produced more skills and techniques and increased the number of new typefaces.

In 1501, an Aldus Manutius edition of Virgil was one of the first published works using italics for body type. Aldus Manutius' aim was to save paper. Italics required less space, and therefore, accommodated more text. Today, italics are used to emphasize single words or short passages of text.

**16th Century**

The Frenchman, Claude Garamond, one of the most distinguished punch-cutters,\* was the first person to cut entire character sets. Previously, printers had to cut type for their own presses. Before any type could be printed, character of type had to be engraved on a piece of steel through an actual punch of a craftsman. Overall, this entire process required heavy manual labor. Garamond now began to sell his type to printers.

**17th Century**

Printing flourished in Paris and in the Netherlands. Punch-cutters from these areas were the most famous in the world.

*\*Punch-cutter refers to a person who draws the characters to be used for casting the moveable metal type.*

<sup>1</sup> Gericke, Michael, *Inspiration & Influence, Step-By-Step Graphics*, January/ February 1992.

***History of Western Typefaces: Gutenberg Influence Period continued***

---

In 1692, King Louis XIV, commissioned this new typeface for the exclusive use of the Imprimerie Royale- the '*romain du roi*.' This alphabet was idealized by using a grid and imposing an orthogonal structure over the organic forms of traditional lettering. Italic forms were generated by shifting the grid. In the late 1700s typographic historians see the fonts of Bodoni and Didot as a logical development away from calligraphy. Called 'modern' these letterforms were composed of extreme thicks and thins and included reduced serifs or thin slab serifs.

***18th Century***

William Caslon, a trained engraver, began the process of making punches for book binding. In the 1720s, he started his own type foundry. Through this, he became well-known in England and Colonial America. Caslon created *Old Style* types which from this date were used throughout the British Empire. It even turned out that many famous works were printed with Caslon's typeface, including America's Declaration of Independence.

**History of Western Typefaces: Industrial Revolution Influence Period** *continued*

---

**19th century**

Development of typesetting techniques have had an indirect influence on script type since early printing processes. Traditional hand-setting was time-consuming; type in general was expensive to produce. A wide range of typeface choices was not available.

Bodoni and Didot triggered a population explosion of commercial typography. Technology encouraged the proliferation of new fonts. The combination of the pantograph and lateral router in 1834 encouraged the proliferation of new typefaces. This pantograph is a tracing device which is linked to a router for carving letters out of wood or metal. It allows different sizes and styles of fonts and is much faster than cutting individual punches by hand. As a flexible system, letterforms changed from ornamental character (compressed, expanded, outline, inline, shadowed, extruded, faceted, floriated, perspectival, bowled) that gave way to a recognition of the letterform through weight, stress, cross-bar, serif, angle, curve, ascender and descender decisions. The relationship between letters within a font became more important than the identity of individual characters. Therefore, during early 20th century, typefaces were organized into type families. Each family consists of a single parent design and included book, italic, bold, condensed, etc. This system is still in use today.

In 1880s, the typesetting machine and lithography were developed. Setting became much faster and more consistent. Because of the increasing demand for type, setters provided a wider range of styles. In 1884, Ottmar Mergenthaler of Baltimore invented the Linotype machine which cast an entire line of type in a single operation. In 1887, Tolber Lanston invented a typesetting machine called the Monotype. It cast single types from a paper ribbon perforated upon a separate keyboard. By the turn of the 19th Century, both Linotype and Monotype became well established.

In 1890s, an experiment took place in Britain in printing that indirectly influenced designers. William Morris (1834-1896), a pioneer of the Arts & Crafts Movement, set up a private press called the Kelmscott Press. Morris designed two types for his press: *Golden* (1891) is based on the magnificent roman types produced by Nicholas Jenson in Venice. Morris made them much heavier, appearing more Gothic. Eventually, *Golden* type led to '*Venetians*'. This type has the axis of the curves inclining to the left with no contrast between thin and thick.

***History of Western Typefaces: Industrial Revolution Influence Period*** *continued*

---

**20th Century**

At the beginning of this century, type designers faced a great challenge because type punches of fonts could be cut by machine from drawings. Moreover, it does not necessarily require the interpretative skills of a punchcutter. Therefore, the development of typefaces became much more experimental. From the 1920s to 1930s, avant-garde designers produced fonts in the early 20th century which tested the structural limits of the alphabet. For example, Theo van Doesburg in 1919 and Bart van der Leek in 1941, designed typefaces to build on the principles of De Stijl painting. The stencil construction of Josef Albers in 1925 generated an alphabetic ensemble of elementary shapes. In 1925, Herbert Bayer designed a Universal typeface at the Bauhaus. Sans serif type became a particular cultural trend surrounding the Bauhaus movement in Germany. Another famous typeface, Futura was designed by Paul Renner in 1928. This period was the time for experimenting with new ideas that were in opposition to Renaissance tradition. Bauhaus typography is best described as constructive and geometric with interchangeable parts used to produce a self-consciously rational font. In 1931, Wladystav Strzeminiski generated letterforms out of right angles and arcs of a circle.

From the 1940s to 1950s, a new photosetting technique began replacing metal typesetting. Typefaces were now transferred photographically to a negative mask from the designer's drawings. It was a much faster and less expensive process.

From 1960 to the present, a multitude of new type designs appeared with increasing frequency. Designers continue to design typefaces which manipulate the formal system of the alphabet. Today's technology allows designers to manipulate existing typefaces. For example Zuzana Licko's font, *Emperor* (1985) embraces the limits of coarse-resolution output. Jeffrey Keedy's *Neo Theo* (1989) is a homage to Modernism. Licko's *Variex* family (1988) shares the same fascination with the geometric system as Bayer's Universal. Due to this advanced technology, designers can generate and use typefaces much more expressively than ever before. Typefaces not only communicate through their meaning, but also through their aesthetic qualities.

***Development of Western Typefaces***

---

***Old Style***

Old Style type began with designs of the punchcutter, Francesco Griffo, who worked for the famous Venetian scholar-printer Aldus Manutius during the 1490s. Griffo's designs evolved from earlier Italian type designs. His Old Style capitals were influenced by carved Roman capitals; lowercase letters were inspired by 15th century humanistic writing styles, based on the earlier Carolingian minuscules. Old Style letterforms have the weight and stress of rounded forms at a 30-degree angle, as in handwriting. The serifs are bracketed (the main strokes gently taper or curve into the serifs). Also, the top serifs on the lowercase letters are at an angle.

***Italic***

Italic letterforms slant to the right. Today, we use them primarily for emphasis and differentiation. When the first italic appeared in the earliest "pocket book", printed by Aldus Manutius in 1501, it was used as an independent typestyle. The first italic characters were close-set and condensed. Therefore, Manutius was able to set more words on a line. Some italic styles are called scripts and are based on handwriting with connected strokes.

***Transitional***

During the 1700s, typestyles gradually evolved from Old Style to Modern. Type design from the middle of the 18th century, including those by John Baskerville, are called Transitional. The contrast between thick and thin strokes is greater than in Old Style faces. Lowercase serifs are more horizontal, and the stress within the rounded forms shifts to a less diagonal axis. Transitional characters are usually wider than Old Style characters.

***Modern***

Late in the 1700s, typefaces termed Modern evolved from Transitional styles. Modern faces no longer reflect qualities of hand-generated letterforms. These typefaces have extreme contrast between thick and thin strokes. Thin strokes are reduced to hairlines. The weight stress of rounded characters is vertical. Serifs are horizontal hairlines that join the stems at a right angle without bracketing. The capital width is standardized; wide letters such as M and W are condensed and other letters, including P and T, are expanded. Modern style typefaces have a strong geometric quality projected by rigorous horizontal, vertical and circular forms.

***Egyptian***

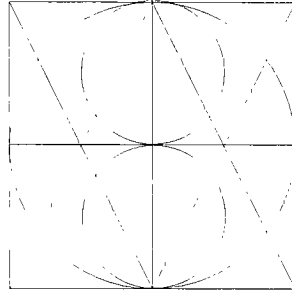
In 1815, the English typefounder Vincent Figgins introduced slab-serif typestyles under the name *Antique*. At the time, there was a mania for ancient Egyptian artifacts, and other typefounders adopted the name Egyptian for their slab-serif designs. These typestyles have heavy square or rectangular serifs that are usually unbracketed. The stress of curved strokes is often minimal. In some slab-serif typefaces, all strokes are the same weight.

***Sans Serif***

The most obvious characteristic of these styles is, as the name implies, the absence of serifs. In many sans serif typefaces, strokes are uniform, with little or no contrast between thick and thin strokes. Stress is almost always vertical. Many sans serif typefaces are geometric in their construction; others combine both organic and geometric qualities.

**Basic Shape of each Capital Letter**

---



**Categories of Letterforms**

---

*Vertical Stroke*

**f h i j l m n r t u**

*Curved Stroke*

**a c e g o s**

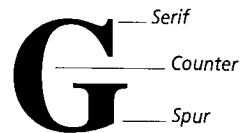
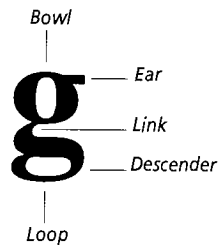
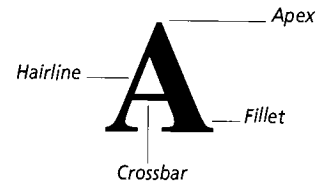
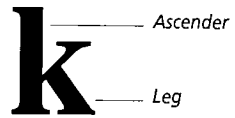
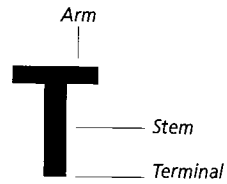
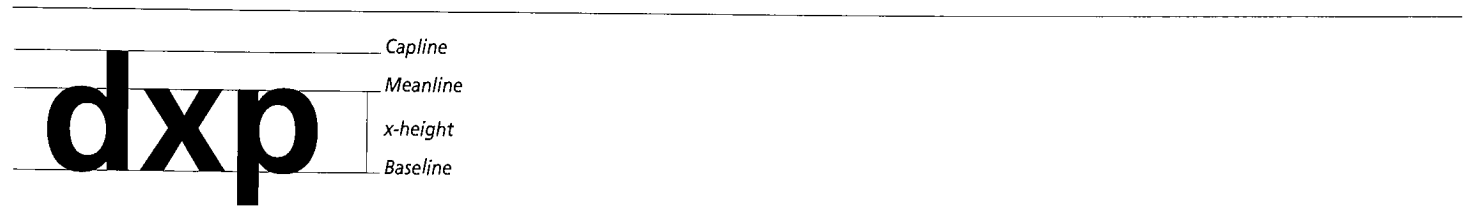
*Vertical and Curved Stroke*

**b d p q**

*Oblique Stroke*

**k v w x y z**

**Parts of a Letter**





### ***Letterform Proportion***

---

Four major variables control letterform proportion and have considerable impact upon the visual appearance of a typeface:

#### ***Ratio of letterform height to stroke width***

- The height of a letter is 10 times the stroke width.
- The thin stroke letter is reduced to one half the normal stroke width.
- The thick stroke letter is expanded to twice the normal stroke width.

#### ***Contrast in stroke weight***

- A change in the contrast between thick and thin strokes can alter the optical qualities of letterforms which is for purposes of emphasis.

#### ***Expanded and condensed styles***

- Typefaces can change dramatically when the width of the letterforms is expanded or condensed.

#### ***X-height and proportion***

- The proportional relationships between x-height and capital, ascender and descender heights influence the optical qualities of a typeface.

### **Legibility**

---

Letterforms must be designed with clarity and be recognized as the characters for which they represent. Legibility is dependent on: contrast, simplicity and proportion.

#### ***The distinguishing characteristics of letterforms***

- The basic structure of each letterform must remain the same. Sufficient contrast must exist between the letters in a font so that they can be easily distinguished.
- Letters can be classified into four groups: vertical, curved, a combination of vertical and curved, and oblique. Letters within a word are most legible when they are taken in equal number from each group.
- The upper halves of letters provide more visual cues for letter recognition than the lower halves. The right halves of letters are more recognizable than the left halves.
- The most frequently used letters, such as the vowels a e i o u, are among the most illegible, and c g s x are easily missed in reading. f i j l t cause confusion and are mistaken for one another.
- The perception of a letter is based on the form/counterform relationship. Letter shapes are the cue that distinguish one letter from another.
- Serif text type is more readable because the serifs reinforce the horizontal flow of each line and also offer more character definition.

#### ***The perception of words***

- One reads and perceives words and groups of words, not just letters. There are two important factors involved in the reading process: word shape and internal pattern.
- Words are identified by distinctive word shapes. Strings of letters are perceived which permit the reader to grasp the content.
- Counterforms create internal word patterns that provide cues for word recognition.
- When these counterforms, or internal spaces, are changed the perceptual clarity may be changed.
- The weight of letters is vital to word recognition.

*\* Legibility is the degree to which a character can be recognized for what the letter is. Readability is the overall ease of reading an entire page (or screen) composition – type and all other elements.*

*Resource: Typographic Design: Form and Communication  
Carter, Day, Meggs.*

**Legibility** *continued*

---

**Capital and lowercase letters**

- If text is set entirely in capital letters, the outer text shape does not contribute to good legibility, even if every type had similar shape and size.
- If text is set in lowercase letters, it will become much more legible. The varieties of irregular word shapes and internal patterns of ascenders and descenders provide rich contrasts that assure the difference in appearance of each particular word shape.

**Interletter and interword spacing**

- The spacing of letterforms has a significant impact on legibility. Minute spatial relationships are controlled to create not only readable, but beautiful and harmonious typographic communication. Letters must flow rhythmically and gracefully into words, and words into lines.
- Typographic texture and tone are affected by the spacing of letters, words, and lines. When texture and spatial intervals between typographic elements are consistent, the result is an easily readable text.
- Texture is also affected by the unique qualities of typeface design.
- Too much or too little space between letters and words destroys the normal texture.
- Space between letters and words should be in proportion to the width of the letters.

**Type size, line length, and interline spacing**

- When these are properly employed, they can improve the legibility of poorly designed letterforms or even enhance the legibility of those forms already considered to be highly legible. The decision is based on comparative judgments. The normal viewing distance for most printed matter is from 12 to 14 inches.
- Small type reduces visibility by destroying counterform, which affects word recognition. Larger type can force a reader to perceive sections of letter rather than the whole. According to legibility research, the most legible sizes of text type at normal reading distances range from 9 to 12 point. This range results from the wide variation of x-heights in different typefaces.

**Legibility** *continued*

---

**Type size, line length, and interline spacing (continued...)**

- Type sizes larger than 12 point may require more fixation pauses, making reading uncomfortable. A fixation pause occurs when the eye stops on a line of type during reading. When there are fewer fixation pauses, there is greater reading efficiency and comprehension.
- When text size is smaller than 9 point, internal patterns can destroy legibility.
- Line length is also essential to reading rhythm. Overly short or long lines will tire a reader. Reading long lines makes it difficult to find the next line. A short column requires the eye to change lines too often, and includes inadequate horizontal perceptual cues.
- Line length is dependent on both the size of type and the amount of space between lines. When working with the optimum sizes of 9, 10, 11 or 12 point text type (a maximum of 10 or 12 words per line) approximately 18-24 pica line length would be acceptable. An optimum line length for average 10 point type is 19 picas.
- If lines are too far apart, it is hard to locate the next line. As column measure increases, line spacing should increase to maintain a proper ratio of column length to line spacing.
- Typefaces with large x-heights need more line spacing. This is also the case for display types because their ascenders and descenders are irregular. They can optically lessen the amount of white space between lines.

**Weight**

- A typeface that is too light or too heavy has decreased legibility. Light typefaces cannot be easily distinguished from the background, while heavy typefaces have a tendency to lose their internal patterns of counterforms.
- Weight can provide the contrast and clarity between typographic elements. A heavier or lighter weight can emphasize one level over another, therefore making information more comprehensible.
- Extreme thick and thin strokes within letters of a particular typeface make reading more difficult to read and prevent smooth transitions from one word to the next. These typefaces also require increased linespacing.

**Legibility** *continued*

---

**Character width**

- A condensed typeface might be selected for a narrow page or column to achieve proportional harmony and an adequate number of words per line.
- The width of letters is also an important legibility factor. Generally, condensed letters are more difficult to read because the counterform relationship changes.

**Italics**

- Similar situations to condensed letters, italics can impede reading. An extreme italic slant can slow the reading process. However, italic type can be very effective when used for emphasis.

**Color combinations**

- When reading large amount of texts, people prefer black type on a white background. Large amounts of text are more legible as black on white, rather than the reversed – white type on a black background.
- Extreme contrast can contribute to a visual vibration that makes reading uncomfortable.
- Reading large amounts of text on glossy bright white paper is more difficult than reading on uncoated white paper.

**Grid system**

- If information is presented with a clear and logical set of titles, subtitles, text, illustrations and captions, it will not only be read quickly but the information will also be more understandable and memorable. Grids can help improve legibility and the communication of ideas because the use of grids help construct a more harmonious integration of typographic and pictorial elements.
- Today, legibility research must proceed beyond the realm of printed communications into the world of electronics. Legibility concerns all media, including printed design, videographics, television broadcasting, computer graphics, and film and laser graphics.

**Legibility** *continued*

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***Distinction: Indentations and line spaces***

- An important goal for a designer is to typographically distinguish one thought from another, clarify content, and increase reader comprehension. Clear separation of paragraphs in a body of text is one principle that contributes to overall clarity.
- It is common in books, magazines, and newspapers to indent the beginning of each paragraph, usually 1-3 ems. It is not common to indent the first paragraph in the article, chapter, or advertisement, in order to maintain a square corner of the first column.
- Paragraphs can also be separated by double linespacing between paragraphs.

***Justified and unjustified typography***

- It was common practice to set type in a justified alignment. However, in the 1920s, designers began to question this typographic convention and experiment with alternative text formats.
- In a justified setting, all lines are equal length, lacking the visual cues for reading.
- The flush left system which leaves a ragged-right outline promotes greater legibility. The typography provides visual points of reference that guide the eye smoothly down the page from line to line.
- In unjustified typography word spacing is even and creates a smooth rhythm and consistent texture. On the other hand, justified typography creates gaps in paragraphs which are disruptive to reading. Whenever possible word spacing should be kept consistent.
- Uncontrolled line breaks can create awkward spaces. The line break can be determined by the meaning and intended message rather than by appearance.

***Electronic page design***

- A major factor influencing legibility is resolution; fewer pixels results in a lower resolution image, which can be less clear and readable.
- Desktop software enables type to be easily manipulated. The designer should employ this tool suitably and thoughtfully.

**Visual Features**

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<b>Serifs</b>	Serifs provide some of the most identifiable features of typefaces, and in some cases they reveal clues about their historical evolution. Serifs aid reading by providing an implied line that helps the eye scan across the line of type.
<b>Weight</b>	This is a feature defined by the ratio between the relative width of letterform stroke and height. On average, a letter of normal weight possesses a stroke width of approximately 15% of its height, whereas bold is 20%, and light is 10%.
<b>Width</b>	Width is an expression of the ratio between the black vertical strokes of the letterforms and the intervals of white between them. When white intervals appear larger, letters appear wider. A letter whose width is approximately 80% of its height is considered normal. A condensed letter is 60%, and an expanded letter is 100% of its height.
<b>Posture</b>	Roman letters that slant to the right but are structurally the same as upright Roman letters are referred to as oblique. Italic letters, which are based on handwriting, are structurally different from Roman letters of the same type family. Italic letters with connecting strokes are called scripts. The angle of posture varies from typeface to typeface. A slant of approximately 12% is considered to be normal.
<b>Thick / Thin Contrast</b>	This visual feature refers to the relationship between the thinnest parts of the strokes in the letters and the thickest parts. The varying ratios between these parts produces a wide range of visual textures in text type.
<b>x-Height</b>	This proportional characteristic can vary immensely in different typefaces of the same point size. Typically, x-heights are considered to be tall when they are at least two-thirds in proportion to the height of capital letters. They are short when they measure one-half the height of capital letters.
<b>Ascenders / Descenders</b>	Ascenders and descenders may appear longer in some typefaces and shorter in others, depending on the relative size of the x-height. Descenders are generally slightly longer than ascenders among letters of the same typeface.
<b>Stress</b>	The stress of letters, which is a prominent visual axis resulting from the relationships between thick and thin strokes, may be left-angled, vertical, or right-angled in appearance.

### **History of Thai Typefaces: Before Sukhothai Kingdom**

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Thai used to be named Tai. Tai kingdom had the power and land in China. Then Tai moved down to the south of China.

#### **12-13 BC**

Tai integrated with the realm of NanJoa.

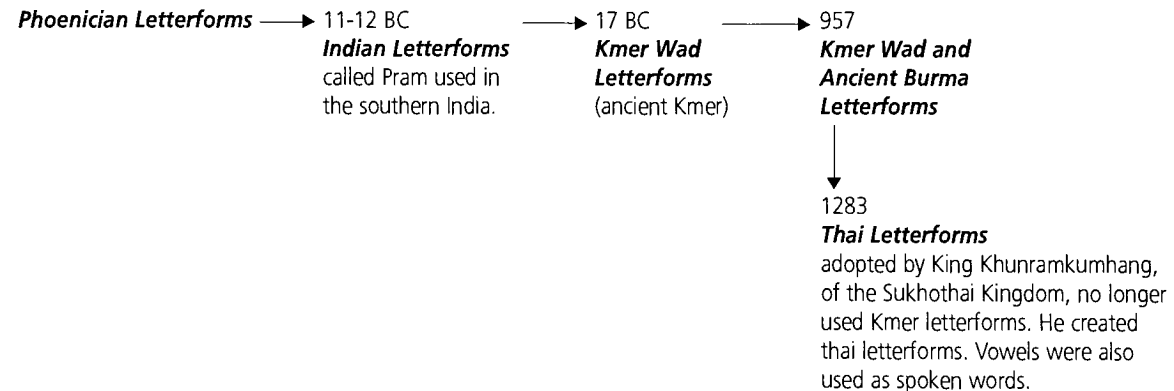
The Indian and the Chinese had the trade around Indo-China; therefore, the culture and language were spread down to the south at Jaopraya, Kong River and Nakhon Pratom Province, which now are in Thailand: but at that time, this area was called the Tawaravadee kingdom.

#### **16-17 BC**

This period Kmer (cambodia) and Phukam (Burma) had authorities in the emperor, therefore the language which people in this area used was Indian, Maun (Burmese) and Kmer. Moreover, China and India contacted this area through trades, embassy and craftsmanship. Therefore, the Chinese and Indian language also influenced the native language.

Similar to Chinese, Thai used monosyllabic language. Sentences started with the subject and verb and ended with an object. Vowels create sounds of words, creating words with different meanings.

From India, Thai adopted literature (such as the Ramayana), the religion (Buddhism) and the letterforms. Professor John Sayday believed that the Indian language was developed from the Phoenician language which reads left to right. Please refer to the chart below:





### **History of Thai Typefaces: Sukhothai Kingdom**

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#### **17-18 BC**

The Tai kingdom was founded at Siam, ancient Kmer and Burma. Three languages were used

- 1 Burmese language
- 2 Kmer language
- 3 Tai language

#### **13th Century**

Use of the Tai language started in the south of China, since the people gathering of the 12 Phu Thai around Sukhothai and Laong Prabang, Laos. He invented Lai Su Thai, the first Thai letters, in 1283. The first engraved stone of King Khunramkumhang, engraved in 1292, is composed of three parts: first, biography of King Khunramkumhang and the war, second, the culture, religion and the civilization of the Sukhothai people and third, the boundaries of the Sukhothai kingdom. We can say that the Sukhothai kingdom is the source of Thai language since many developments of the language started and gradually became uniquely Thai. For example, repetitive words were used for beautiful sound and pronouns and qualitative nouns were created. A royal language was created for the king in which some words were borrowed from Kmer. Idioms and proverbs were also created for teaching children.

From 1354 to 1378, the kingdom belonged to King Lithai. He was the expert in Pali language. At this time Thai grammar was changed to match that of Pali. For example, vowels were placed for each consonant. Usually, there were five sounds in a tone. However, under the new rule of King Lithai, tones were changed to having only two sounds.

### **Ayuthaya Kingdom**

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In this period, Thai letterforms rarely changed due to the wars with Burma for nine years from King Uthong to King Ramatipodee. Instead of typography, literature was mainly influenced in Kmer and India. During King Trilongkanard's rule of the MengRai Kingdom, Pali letterforms were written in Buddhist Bibles.

### **Krungthonburi Kingdom**

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This kingdom was unstable and brief in length. Therefore, no changes in the Thai language were made. Once the kingdom was in peace, the literature, Ramakein\*, was written in verses. Before that, literature was written only in prose. It is an important study in many high schools today.

*\*Ramakein is the ancient literature which came from India. Therefore, the language in this period will be influenced by Pali and Sanskrit language.*

### ***History of Thai Typefaces: The Beginning of Ratanakhosin Kingdom (1782-1910)***

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During this period society was very peaceful and many developments started since Thailand contacted with other countries, including Western countries. Designs of letterforms were influenced by the Western culture. Many important books were written during this time:

In 1822, an injecting vaccine manual was written. Book on pre-natal care was also written on papyrus paper.

In 1828, grammar of Thai language, by James Low, was printed in India .

In 1836, the book containing all 44 letterforms was first written by Dr. Brood Lay. Kho-Kai, a form of lottery, was created. This was the first use of Thai letterforms for commerce, not for academics.

In 1837, Nancy Hudson and Hough Low designed and printed a new set of Thai letterforms. These letterforms were 32-point rounded and italic shaped. The Thai dictionary of JH Chandler was written by hand.

In 1839, the announcement of opium prohibition was written with oblique and italic letterforms.

### ***King Jomkraow (King IV)***

---

King IV was an expert in Pali and Sanskrit as well as in English. He founded the first available printer in the palace and designed the typeface for printing. Thai letterforms were drawn again for more convenient printing in 1847. The first document, Rachakichanubeka, a government gazette, was printed by his printer in 1858.

In 1864, he changed the arrangement of vowels by aligning them on the same line, followed by a syllable, as in English. This typeface was called *Ariya*. However it was not popular. Therefore, he imitated syllables by using Roman letterforms. He also created the 8 new vowels from Pali vowels. King IV attempted to print the first Buddhist Bible. This was not accomplished until King Chulalongkorn came into rule in 1894.

In 1854, the first lithographic press was built.

In 1861, normal, curved and straight letterforms were designed in many sizes for the printing process. And King Jomkraow wrote and printed a story about travelling in London.

Governor Sarnprasert (Noi Ajarayangkul) wrote many standard text books and established the system for Thai grammar. He was promoted to Praya Srisunthornvoharn by King Chulalongkorn and developed only six Thai language textbooks which were called Tumrareinluang (The Royal Textbooks).

### ***History of Thai Typefaces: King Chulalongkorn (King V )***

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King Chulalongkorn was called the reforming king since he founded the first school which allowed soldiers the opportunity to learn to read and write. Now this school also open to the general public. This revolution in education began to influence the design of Thai letterforms printing technology.

In 1867, the first Thai dictionary, named *Kichanukit*, was printed by lithography from handwriting.

In 1873, the first dictionary of Siamese language, *Rachakichanubekha*, was printed by Dr. Brood Lay.

In 1883, the public dictionary was written by Pa Salalak.  
Mafaland press was founded.

In 1892, Praya Dumrongrarchanuparp wrote three beginning books for improved memory retention.  
In the books, he created prose and included pictures for elementary school children.

In 1901-1906, a bold typeface was drawn for printing.

### ***History of Thai Typefaces: King Mongkut (King VI )***

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King VI was the scholar of literature. He declared that every Thai person must go to school. This period marks the development of Thai letterforms to a more advanced level due to the public's understanding and their ability to read and write. Therefore, many new typefaces were created in this period.

In 1908, many presses were founded, such as Aksornsopon, Aksornniti and Nipanthanakorn.

In 1917, King VI developed the current way of writing. He removed some of the vowels. All vowels followed syllables. He also created forms of vowels which were written in the same line.

Praya Auphakitsilapasarn (Nim karnjanacheva) rearranged Thai grammar, which is the standard grammar now.

In 1919, *Light Pong*, a new typeface, was designed.

In 1924, King VI designed italic letters for printing.

### **History of Thai Typefaces: Present Radthanakhosin Kingdom**

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In this period, Thai people received more education, along with freedom. Therefore Thai letterforms continued to develop. However, the developments were still slow if compared with the developments of English letterforms. Most of the Thai letterforms have been designed or developed by printers or newspaper companies. As a result, this period focused on important events related to the discovery of the newspapers or printing presses.

In 1927, King VI cancelled the third and fifth letters in Thai language.

In 1929, *Gentleman*, *Daily News* and *Monday* newspapers were founded.

In 1930, *Pong Sa* typeface was designed by Mr. Sa. It was used in the *Bangkok Karnmaeng* newspaper.  
*Pong Mai* typeface was designed.

In 1933, Wat Sungvad Printer School was founded.

In 1934, *Weekly Prachachat* newspaper was founded.

In 1935, the new policy for education in Thailand was developed.

In 1936, the new 40-point Pong typeface was created.

In 1942, General Prak Phibunsongkram, Prime Minister, stopped using the similar sounding letters.  
He declared the use of arabic numbers for official documents, instead of Thai numbers.

In 1945, writing was changed by using 44 syllables and 32 sounded vowels.  
The letterforms were not changed, but the use of similar sounding consonants stopped.

In 1946, *Bangkok Post* newspaper was founded.

In 1947, *Pimthai* newspaper was founded.

In 1949, *Aksornsarn* newspaper was founded.

In 1950, *Siamrat* newspaper was founded.  
The standard dictionary, *Rachabundhitayasatharn*, was printed.

In 1953, a typeface, similar to a typewriter typeface, was created by Mr. Smarn Bunyaratapun, called *Telex*.  
Bangkok Technique College opened a printing program.  
Department of Ordnance Survey used photocomposition and offset lithography.

***History of Thai Typefaces: Present Radthanakhosin Kingdom continued***

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In 1957, Kurusapha used Rotary offset printing. Monotype was used by Thaiwatanapanid Press.

In 1961, *Thairat* newspaper was founded.

In 1962, *Unesco* typeface was designed by Mr. Manid Kawinapong.

In 1963, the first printing exhibition was displayed in Thailand.

In 1964, *Dailynews* newspaper was founded.

In 1967, *Daily* newspaper started using offset lithography printing processes.

In 1970, Mr. Sanun Patamathin collected 34 lead printed typefaces from Karnreingpim press.

In 1973, *Daily Prachatipatai* newspaper and *Lalana* magazine were founded.

In 1974, meeting to develop printing types

Mr.Thongtaem Samasud founded Compugraphic, the Phototypesetters Company.

*Letraset* and *Macanorma* typefaces were designed.

In 1982, the current Thai dictionary, *Rachabundithayasatharn*, was developed. *Linotype* was designed.

In 1987, *Macintosh Sahaviriya* font

In 1988, *DB*, *Unity* and *Eac* fonts were designed.

In 1997, the *New Thaipography* was designed and developed.

### ***Basic Shapes of Ancient Thai Letterforms***

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Ancient Thai letterforms have 3 classes:

#### *Horizontal Line Letterform*

Another name for this type of letterform is “rounded letterform.” Most of the letters are written under the baseline

(please refer to the page 42, *Thai Letter on Grid*). This letterform has different names such as *Lanna*, *Esan*, *Thai yai*, *Kern*, *Lu* and *Thai arhom*.

#### *Half-Vertical Line Letterform*

This letterform has different names, such as *Fukkarm* or “tamarind-pod shape”, *Khunram*, *Thai noi*, *Black Thai*, *Thai-Kmer*.

#### *Vertical Line Letterform*

This letterform is the pattern for today's letterforms. In ancient times, it was called *Bunjong*, which means “written delicately in Thai.”

### ***Influences of Ancient Letterforms***

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#### ***Fukkarm***

*Fukkarm* letters were founded in the north of Thailand. The tamarind, a Thai fruit shaped like a long curved string bean, was an influence on the design of these letters. Lanna Kingdom used these letters to communicate. It is similar to Sukhothai's letters. *Fukkarm* has been used for 416 years from 1411 to 1827. However, the Sukhothai people only used *Fukkarm* for the first 200 years. The letters were engraved on more than 100 stones.

#### ***Lai Su Thai***

Defined as Thai letters, they were first found in the Khunramkumhang's engraved stone. Dr. Brood Lay gathered Thai words in the first book, *Akaraphithanosarup* in 1873.

#### ***Prame***

These letters were used only in India during 243 BC- 57. They spread to the south, to the Suwanapum Kingdom. Thai has two names for these group of letters, depending on the location. The letters used in the south, called *Prame*, had been engraved in cubic shape. Then they were changed to a rounded shape for the purpose of easy engraving. Another is used in the north of Thailand, called *Tavanakry*, developed from *Kupta* letters, used in Thibate and southern China in 357. *Kupta* was written from left to right and under the baseline. Later on, the baseline was also written with each letter and therefore, became part of the letter itself. In 433, *Kupta* was developed by adding the vertical, horizontal, diagonal and curve line to its shape. These letterforms were called *Nail* or *Tavanakry*, written in *Sanskrit*. During 957, Persia and India had diplomatic relationships, therefore Persia's letters, *Urdu*, had an influence on *Tavanakry*. After India and Pakistan separated their nations, India used *Hindi* while Pakistan used *Urdu*.

#### ***Pullava***

In 457-557, Pullava Kingdom was flourishing in India, therefore *Pullava* also influenced Thai letter. Stones and documents were found that indicated how India was associated with the Suwanapum Kingdom. *Pullava* was developed from *Krona*. Due to *Pullava*'s simplicity and beauty, other countries developed their own letterforms from *Pullava*.

#### ***Krona***

*Krona* letterforms have simple, rounded edges with a curved angles. In 243 BC, King Asokmaharad combined *Prame* and *Krona* for religious purposes. It was written in *Sanskrit*. *Krona* was named *Thamin* when it was used in Malaysia, Singapore and Srilunga.

### **Development of Thai Typefaces**

#### **Thai in Sukhothai**

The Thai letter has been developing for a long time. King Khunramkumhang invented the first Thai letter in 1283. It has curved and rounded shapes. Consonants and vowels were written on the same line and had only two consonant sounds. (See diagram below)

In 957, the letterforms changed

From 957-1057, *Pullava* was completely changed to the *Ancient Kmer* letter.

In 1157, the engraved stone was found in Lumpun Province, northern Thailand. The letterforms are in 8urma characters because of their occupancy during 957-1257.

In 1362, Sukhothai letter spread to eastern Thailand: the document was found in a Prayun temple. Also in 1543, Sukhothai's letter spread to Lanna Kingdom in the north.

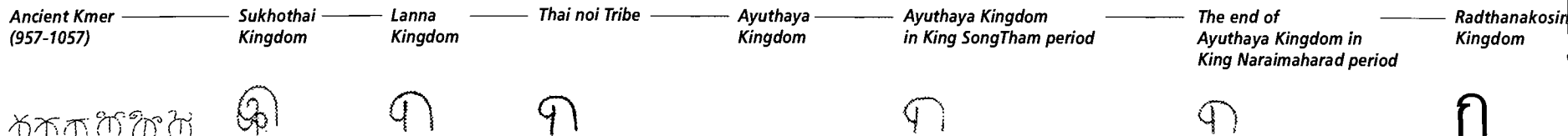
#### **Thai in Ayuthaya**

There were trading documents between Ayuthaya and Denmark in 1557. As a result, Thai letters were influenced by a western country for the first time. Letterforms in the periods of King Naraimaharad and at the end of Ayuthaya were simple and clear.

#### **Thai in Rathanakosin**

Thai is composed of four consonant forms with five consonant sounds, 3 classes of consonants (high, middle and low consonants), 28 vowel forms and 32 vowel sounds.

The chart below shows the development of Thai letterforms ordered by time periods, starting from Ancient Kmer to the current Rathanakhosin Kingdom.





### Classification of Contemporary Thai Typefaces

#### Traditional Type

These typefaces are designed to imitate the engraved stone. Some versions have strokes similar to pen writing, called calligraphic type. The calligraphic typefaces have long beautiful endings which are hard to read. Some versions are italic. The calligraphic typefaces are seen in the Buddhist Bible.

EAC Sisachanalai	กษชคคกงจจชชฌญญฐฐฒฒณณตถถททธธนบปผฝฟฝภภยรลวศษสฬฬฮฮอ ๑๒๓๔๕๖๗๘๙๐ 1234567890
EAC BSi Sachnalai	กษชคคกงจจชชฌญญฐฐฒฒณณตถถททธธนบปผฝฟฝภภยรลวศษสฬฬฮฮอ ๑๒๓๔๕๖๗๘๙๐ 1234567890
EAC Rajchaphruek	กษชคคกงจจชชฌญญฐฐฒฒณณตถถททธธนบปผฝฟฝภภยรลวศษสฬฬฮฮอ ๑๒๓๔๕๖๗๘๙๐ 1234567890
Sukhothai	กษคคกงจจชชฌญญฐฐฒฒณณตถถททธธนบปผฝฟฝภภยรลวศษสฬฬฮฮอ ๑๒๓๔๕๖๗๘๙๐ 1234567890
Ratchaburi	กษชคคกงจจชชฌญญฐฐฒฒณณตถถททธธนบปผฝฟฝภภยรลวศษสฬฬฮฮอ 1234567890

#### Standard Type Simple/Clear

These typefaces have a uniform stroke weight with a head which is very important for legibility. There are many font weights in a family such as EAC Lanna. Letters are composed of vertical, horizontal, diagonal, or top-curved lines. These typefaces are the most standard for children who are starting to practice their writing at an elementary level.

EAC Chuan Pim	กษชคคกงจจชชฌญญฐฐฒฒณณตถถททธธนบปผฝฟฝภภยรลวศษสฬฬฮฮอ ๑๒๓๔๕๖๗๘๙๐ 1234567890
EAC Lanna	กษชคคกงจจชชฌญญฐฐฒฒณณตถถททธธนบปผฝฟฝภภยรลวศษสฬฬฮฮอ ๑๒๓๔๕๖๗๘๙๐ 1234567890
EAC Bold Lanna	กษชคคกงจจชชฌญญฐฐฒฒณณตถถททธธนบปผฝฟฝภภยรลวศษสฬฬฮฮอ ๑๒๓๔๕๖๗๘๙๐ 1234567890

#### Typewriter Type Simple/Clear

These typefaces were developed for the typewriter. They are almost the same as the standard typefaces except some letters such as the 2nd, 3rd, 10th, 11th, 13th, 24th, 26th and 27th have serifs with a more cubic shape.

Votra 1	กษชคคกงจจชชฌญญฐฐฒฒณณตถถททธธนบปผฝฟฝภภยรลวศษสฬฬฮฮอ ๑๒๓๔๕๖๗๘๙๐ 1234567890
Votra 2	กษชคคกงจจชชฌญญฐฐฒฒณณตถถททธธนบปผฝฟฝภภยรลวศษสฬฬฮฮอ ๑๒๓๔๕๖๗๘๙๐ 1234567890
Votra 3	กษชคคกงจจชชฌญญฐฐฒฒณณตถถททธธนบปผฝฟฝภภยรลวศษสฬฬฮฮอ ๑๒๓๔๕๖๗๘๙๐ 1234567890
Votra 4	กษชคคกงจจชชฌญญฐฐฒฒณณตถถททธธนบปผฝฟฝภภยรลวศษสฬฬฮฮอ ๑๒๓๔๕๖๗๘๙๐ 1234567890

These typefaces are used for headlines in newspapers. The letters are more cubic and have highly contrasted stroke weights. The letter height of all letters has been changed to be similar in order to increase the amount of available area on the page.

**กบขคภพจวคชฉณนยอธทฒณภคถทธมปปณปพฟภมยปรภวษสทศอธ 1234567890 1234567890**

These typefaces are between the standard and modern type. The head, the most important aspect of Thai letterforms, is manipulated by changing its shape from a perfect circle to a curve, semi-circle or an oval. Some of these typefaces have bigger heads than standard type. The letters are also manipulated by using different stroke weights. The width of the letter varies from condensed to wide.

กขขคคฃงจฉชฌญฎฏฐฑฒณดตถทธนบปผฝพฟภมยรลวศษสหฬอฮ ๑๒๓๔๕๖๗๘๙๐ 1234567890

กขขคคฆงจฉชฌญฎฏฐฑฒณดตถทธนบปผฝพฟภมยรลวศษสหฬอฮ ๑๒๓๔๕๖๗๘๙๐ 1234567890

กบคฆงจจขขฌณณฎฐฏทฌฌดตถทธนบปผฝพฟภมยรลวศษหฬอฮ 1234567890

กขชคคฆงจณชฌณญฐฑฒณดตถทธนบปฝฟภมยรลวศษสหฬอฮ ๑๒๓๔๕๖๗๘๙๐ 1234567890

The head of the letter is changed to a serif in these faces. A variety of different weights, widths and heights are used. Some typefaces have no head at all, making the letters hard to read. Because of their unique and unfamiliar characteristics, these typefaces are very popular for Thai designers.

EACKanniku	กขชคตมจจชชนญฏฐฎฐฒณดตถทธนบปผฝพฟภมยรลวศษฬหฬอ ๑๒๓๔๕๖๗๘๙๐ 1234567890
EACLikannika	กขชคตมจจชชนญฏฐฎฐฒณดตถทธนบปผฝพฟภมยรลวศษฬหฬอ ๑๒๓๔๕๖๗๘๙๐ 1234567890
EACManawika	กขชคตมจจชชนญฏฐฎฐฒณดตถทธนบปผฝพฟภมยรลวศษฬหฬอ ๑๒๓๔๕๖๗๘๙๐ 1234567890
DB Sathom Medium	กขชคตมจจชชนญฏฐฎฐฒณดตถทธนบปผฝพฟภมยรลวศษฬหฬอ 1234567890
ABC Pathom Light	กขชคตมจจชชนญฏฐฎฐฒณดตถทธนบปผฝพฟภมยรลวศษฬหฬอ ๑๒๓๔๕๖๗๘๙๐ 1234567890
Macha	กขชคตมจจชชนญฏฐฎฐฒณดตถทธนบปผฝพฟภมยรลวศษฬหฬอ 1234567890 1234567890
Chimongkol	กขชคตมจจชชนญฏฐฎฐฒณดตถทธนบปผฝพฟภมยรลวศษฬหฬอ 1234567890

Because there are many foreigners in Thailand (such as Chinese), these typefaces are designed for festive occasions in Thailand such as the Chinese New Year. These typefaces are seldom used for normal, daily purposes.

**Chawlewhiang      กบฏกษัตริยราชพยุหยาทัพณผดุงมหาราชวังในสมัยรัชกาลที่ ๑๒ ๑๓ ๑๔ ๑๕ ๑๖ ๑๗ ๑๘ ๑๙ ๒๐ ๒๑ ๒๒ ๒๓ ๒๔ ๒๕ ๒๖ ๒๗ ๒๘ ๒๙ ๓๐**

## ***Synthesis***

---

## Thai Letterforms

---

By studying Typography in Western / European History, Principles and Theories in the research and analysis section, the synthesis of Thai letterforms will show how the information was applied through the new typeface design. This makes this typeface differ from existing Thai typefaces and more principle.

In *Categories of Thai Letterforms*, on page 40, existing Thai letterforms are classified by their shapes into Vertical Stroke, Curve Line, Curved line and Vertical Strokes and Oblique Stroke. Thai letterforms have important parts, called 'head', 'mouth', and 'tail.' The head is the most distinctive and recognizable characteristic which makes Thai letterforms different from one another. Only the first letter of a word has a mouth. The tail optically functions like an ascender or descender for the Thai letter. The section on the *Part of a Letter* shows distinctive characteristics that are important for each particular letterform. It cannot be deleted or taken out in any way without losing legibility.

An important factor that must be carefully considered when designing the new Thai typeface is penmanship. When comparing Thai and Western writing, Western writing arranges consonants and vowels only on a baseline. But Thai writing has an arrangement in 4 levels (see *Thai letter on a Grid* on page 43). Only consonants and some vowels are arranged on a baseline. Tones are arranged over the meanline or over caplines 1 or 2. Some vowels are arranged under the baseline. These different arrangements affect line spacing.

Another factor is the proportion of a letterform. Visual principles and theories are applied throughout the design such as the x-height, stroke width, stroke weight, condensed or expanded, serif or sans serif, form/ counterform relationships, etc.

This section will inter-relate with a design section. It is important to understand how Thai letterforms are different or similar to English letterforms before the design process. The following pages will include *Categories of Thai Letterform*, *Thai Letter on a Grid*, *Parts of Letter*, *Distinctive Characteristics of Thai Letters* and *Form of a Letter*.

**Categories of Thai Letterforms**

---

**Vertical Stroke**

*Thin Width (Consonants)*

ป ข ฃ ช

*Thin Width and Curved line (Consonants)*

ฉ ร

*Normal Width and Extra Circle Shape (Consonants)*

ฅ ฆ ม ห

*Normal Width and Circle Shape (Consonants)*

ย บ ป ฝ

*Extra Thin Width (Vowels and Tones)*

โ ไ ใ ำ แ อ + ิ  
๑ ๒

**Categories of Letterform**

---

**Curved Line**



**Vowels and Tones**



**Numerals**

**Categories of Letterform**

---

**Curved Line and Vertical Stroke**

*Normal Width (Consonants)*

กคคจจฎฎดต  
ถลลวศสอฮ

*Combination between letters (Consonants)*

ณณณณณ

*Descender (Consonants)*

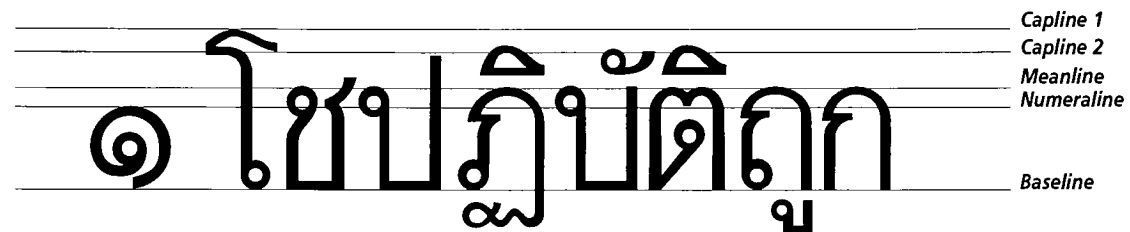
ญญญ

**Oblique Stroke**

บผผพพพ



*Thai Letter on a Grid*



*Part of a letter*

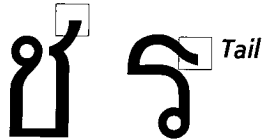
---

*Mouth*



*Head*

*Tail*



*Tail*

*Distinctive Characteristics of Thai letters*

---

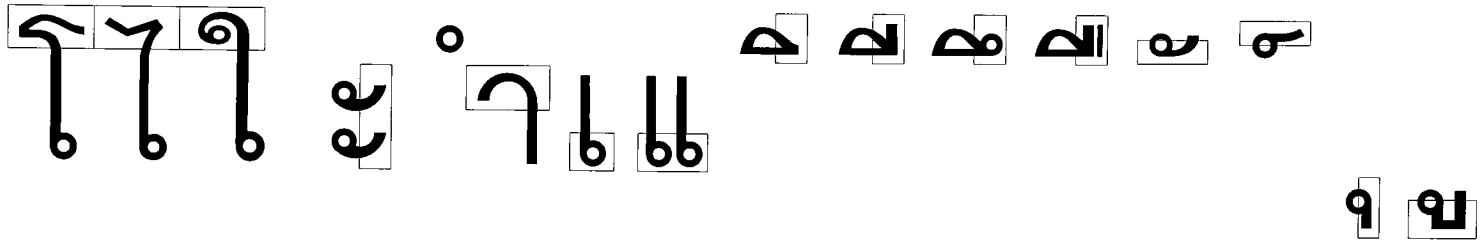
*Consonants*

ก ข ฃ ค ฅ ฆ ง จ ฉ ช ซ ฌ  
ณ บ ป ผ ฝ พ ฟ ภ ม ย ร  
ล ว ฎ ฏ จ ฌ ฑ ฒ ณ ด ต ถ ท  
ล ว ศ ษ ส ห ฬ อ ฮ

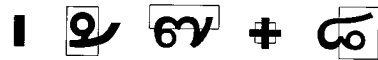
## Distinctive Characteristics of Thai letters

---

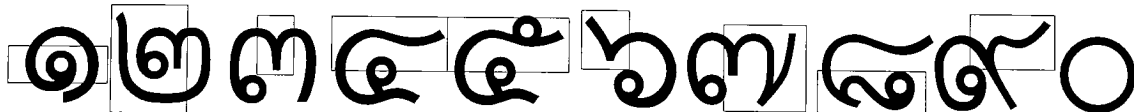
### Vowels



### Tones



### Numerals



### Form of a Letter

The chart below shows an initial rating of different typeface styles (geometric, organic and sans serif, serif) in the following areas: legibility, readability, contemporary, fast communication and Thai recognition. Before a new Thai typeface is designed, these areas must be carefully considered. For example, the organic typeface style, with a high rating of four in the area of Thai recognition, was an influence on the new Thai typeface design. Based on the overall rating system of these typeface styles, geometric and sans serif were chosen as main influences on the design of the new Thai typeface.

		<i>Geometric Chosen</i>	<i>Organic</i>
4 very good	<b>Legibility</b>	<b>4</b>	<b>3</b>
3 average	<b>Readability</b>	<b>4</b>	<b>3</b>
2 poor	<b>Contemporary</b>	<b>4</b>	<b>2</b>
	<b>Fast Communication</b>	<b>4</b>	<b>3</b>
	<b>Thai Recognition</b>	<b>3</b>	<b>4</b>

		<i>Sans Serif Chosen</i>	<i>Serif</i>
	<b>Legibility</b>	<b>3</b>	<b>4</b>
	<b>Readability</b>	<b>4</b>	<b>4</b>
	<b>Contemporary</b>	<b>4</b>	<b>2</b>
	<b>Fast Communication</b>	<b>4</b>	<b>3</b>
	<b>Thai Recognition</b>	<b>4</b>	<b>2</b>

***Ideation, Evaluation and Implementation***

---

### ***The Problem with Thai Typefaces***

---

#### *Existing Situation: Text Type*

There are currently only 107 Thai typefaces. This is problematic because there are not enough options for Thai designers as compared to the range of typefaces available to western designers.

Some Thai typefaces consist of a family of type with a maximum of four stroke weights. Some typefaces have only one stroke weight. English typefaces, by comparison, offer a wide range, such as light, normal, medium, bold, extra bold and italic styles.

Some of the typefaces are not legible and readable enough as text type. And some Thai typefaces fail when they are reduced because certain structures of the letters are eliminated.

#### *Existing Situation: Display Type*

There are no display typefaces for special products in Thailand such as fashion\* and highly technical products.\*\* Most Thai typefaces are used primarily for text type. If designers want to have special typefaces for certain products, they must create their own. Therefore, the design of a new display font will be useful because it offers other choices and saves time and money for the designer. Obviously, this new display font may be appropriate only for certain projects.

This new display typeface will have characteristics enabling designers to use it for many contemporary products. Some of these characteristics are the organic forms within simple geometric shapes. These qualities do not presently exist in Thai text type. However, Thai recognition in the new typeface is also essential. By emphasizing some characteristics that western typefaces do not have such as 'head', 'mouth' or 'tail', this new typeface will clearly be more recognized as a Thai typeface.

\* fashion in this project means contemporary which is very new or temporarily in vogue. For example, fashion products are contemporary clothes, art books, etc.

\*\*highly technical products in this thesis refers to the products which use advanced technology such as cellular phones, cars, televisions, etc.

**Concept of the New Typeface**

---

Thai typefaces have been in existence for quite some time but designers have not really been involved in their development. Originally, Thai type designs have been developed by printers. If typeface development had progressed in Thailand as it has in the West, it would reflect more avant-garde experimentation.

Thai typefaces have two main problems:

- 1 They are designed by imitating English typefaces. Although some may appear contemporary, they do not have enough Thai recognition.
- 2 Typefaces are currently used for both headline and text purposes. This is not always ideal. Display types should be used in bigger sizes for headlines. Text types should be designed specifically for smaller and often longer, descriptions.

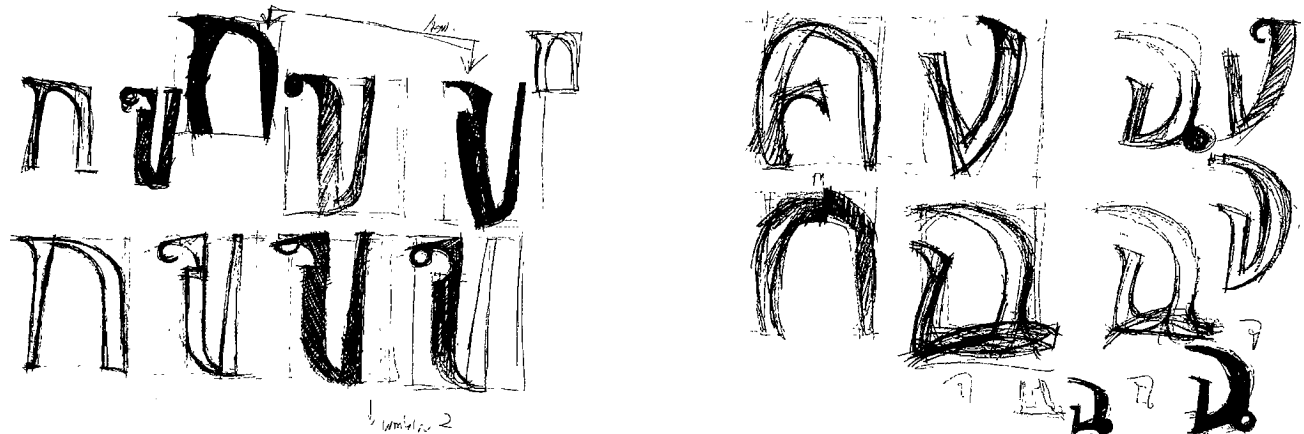
The font designed as part of this project will attempt to address the problems stated above. Qualities of traditional Thai handwriting (clarity, beautiful contrasts in stroke weight) will be combined with the simple geometry of more contemporary typefaces.



## **Preliminary Ideation**

### **Preliminary Sketches**

The first step of this design project involved choosing three letters that have different characteristics. The first three letters of the Thai alphabet were chosen. The first letter has a 'mouth' and normal width. The second has a 'head' and thin width. Lastly, the third has a 'head' inside the counterform. The preliminary sketches were designed to reflect a wide range of styles (see picture from page 51st to 52nd). 18 different approaches were developed before the preliminary evaluation was done.



Typeface 1

U U A A

Typeface 2

U U A

Typeface 3

U U A

Typeface 4

U U A

Typeface 5

U U A

Typeface 6

U U A

Typeface 7

U U A

Typeface 8

U U A

Typeface 9

U U A

Typeface 10

U U A

Typeface 11

U U A

Typeface 12

U U A

Typeface 13

U U A

Typeface 14

U U A

Typeface 15

U U A

Typeface 16

U U A

Typeface 17

U U A

Typeface 18

U U A

### **Preliminary Evaluation**

---

This evaluation is for testing the style of the new typeface. The questionnaire included the following design considerations:

- 1 Clear legibility / easy to read
- 2 Dynamic, contemporary feeling
- 3 Clearly recognized as Thai language
- 4 Noticed as new approach to Thai design
- 5 Good visual harmony in letterforms
- 6 Good proportion inside each letterform
- 7 Strong technological feeling
- 8 Strong high fashion feeling

1, 5 and 6 are the qualities which type designers must be concerned with because typefaces are not only for function but also for visual beauty.

2, 4, 7 and 8 are the qualities which this new typeface must have because of its original goals. This new typeface is intended for certain kinds of products.

3 is important because the typeface must function for Thai language.

Since this project involves the development of a Thai typeface, it must be evaluated by Thai people. All of these individuals are native Thai speakers. 10 non-designers and 10 designers at RIT were chosen to question.

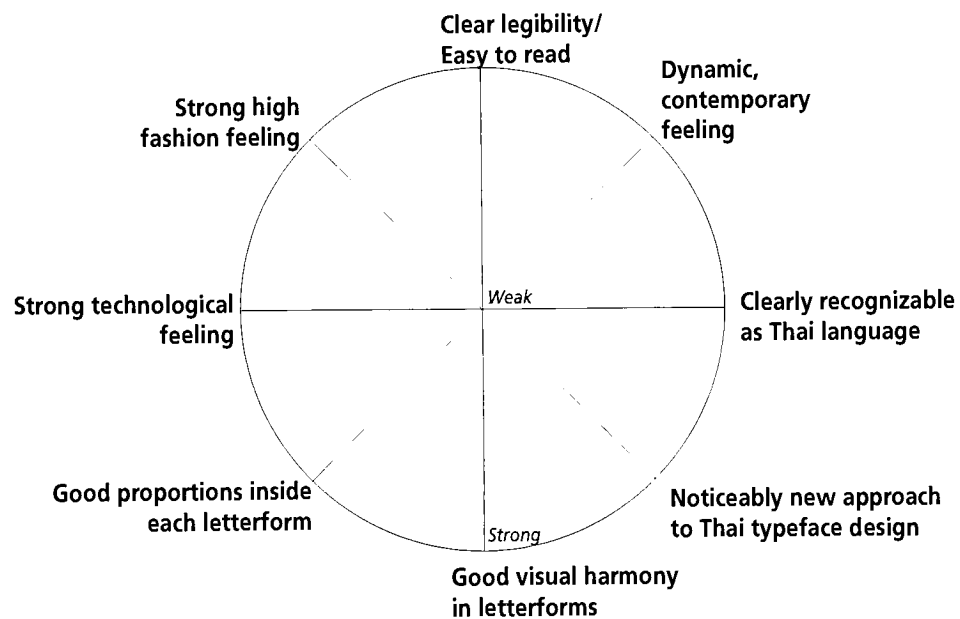
The results were calculated by counting the three highest scoring typefaces for the Clear legibility, Clearly recognizable and Dynamic, contemporary feeling categories. These three factors are priorities for designing the new typefaces. The scoring must be more than 50% on each line. After receiving the feedback from the preliminary evaluation, the next step was to develop the chosen faces even further.

**Preliminary Evaluation** *continued*

**Name**

**Major**

**Age**



**Other Suggestions**

### ***Preliminary Evaluation Summary***

---

The summaries are based on the feedback from the sketches in this first evaluation.

There are 8 criteria:

- 1 Clear legibility
- 2 Dynamic and contemporary feeling
- 3 Clearly recognized as Thai language
- 4 Noticed as new approach to Thai typeface design
- 5 Good visual harmony in letterforms
- 6 Good proportions inside each letterform
- 7 Strong technological feeling
- 8 Strong high fashion feeling.

The **three highest scoring typefaces** will be developed further. The typefaces below received the 3 highest scores from the eight criteria. (See the explanation on Page 56)

#### ***Clearly Legibility***

Typeface 1    ท ู อ อ

Typeface 5    ท ู อ

Typeface 18    ท ู อ

*Preliminary Evaluation Summary continued*

*Dynamic and contemporary feeling*

Typeface 2 ก ข ค

Typeface 4 ก ข ค

Typeface 5 ก ข ค

Typeface 18 ก ข ค

*Clearly recognizable as Thai language*

Typeface 4 ก ข ค

Typeface 5 ก ข ค

Typeface 12 ก ข ค

Typeface 18 ก ข ค

*Preliminary Evaluation Summary continued*

*Noticeable new approach to Thai typeface design*

Typeface 8

ก ข ค

Typeface 12

ก ข ค

Typeface 17

ก ข ค

*Good visual harmony in letterforms*

Typeface 2

ก ข ค

Typeface 6

ก ข ค

Typeface 7

ก ข ค

**Preliminary Evaluation Summary** *continued*

**Good proportions inside each letterform**

Typeface 1    n v A A

Typeface 18    n v A

**Strong high fashion feeling**

Typeface 5    n v A

Typeface 7    n v A

Typeface 8    n v A

**Strong technological feeling**

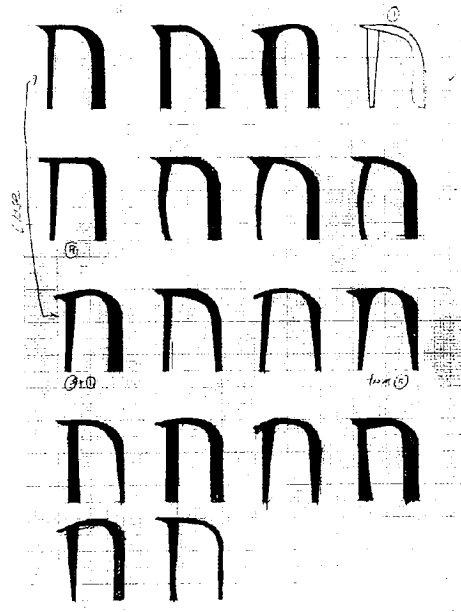
Typeface 7    n v A

Typeface 8    n v A

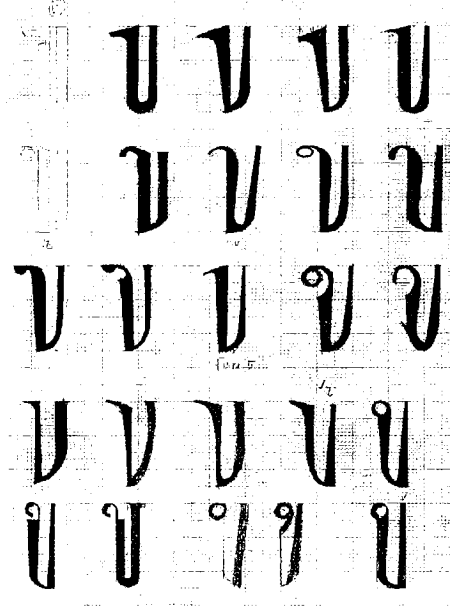
Typeface 10    n v A



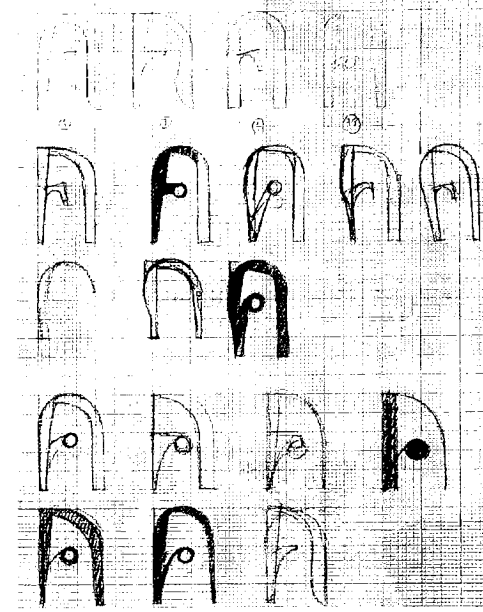
**Development**



*The first letter*



*The second letter*



*The third letter*

These designs were developed from selected typefaces after the Preliminary Evaluation. These approaches were improved by changing the negative space inside each letterform to make them different from existing Thai typefaces.

THAT THAT

THAT THAT

THAT THAT THAT

THAT THAT

Final Approach

THAT

The development of these letterforms show clear Thai recognition, based on the emphasis of distinctive characteristics, such as the 'head' and 'mouth.' The negative space inside the letterforms focuses on organic forms at the same time the contour of each letterform focuses on geometry. It is these changes that give the new typeface its contemporary quality.

**Final Approach**

Thai Alphabet

ก ข ฃ ค ฅ ง จ  
ฉ ช ซ ฌ ญ ฎ ฏ  
ฐ ท ฒ น ด ต  
ณ ท จ บ ปร  
พ ฟ ภ พ ท ษ  
ธ ส ฏ ศ ษ ส  
ห พ จ จ

Thai Numerals

๐ ๑ ๒ ๓ ๔  
๕ ๖ ๗ ๘ ๙

**Intermediate Evaluation**

**Font 1**

**Chotima Vongviriyatham**

Name \_\_\_\_\_

Major \_\_\_\_\_

Age \_\_\_\_\_

Can you recognize the new typeface clearly and quickly as Thai language?    Yes    No

If no, why? \_\_\_\_\_

Can you clearly recognize the differences between each letter?    Yes    No

If no, which letters are difficult to distinguish and why? \_\_\_\_\_

Does this new typeface have good visual harmony?    Yes    No

If no, why? \_\_\_\_\_

Is each letter well proportioned?    Yes    No

If no, which letters are problematic and why? \_\_\_\_\_

Are words clearly readable in this typeface?    Yes    No

If no, why? \_\_\_\_\_

Does this new typeface feel dynamic and contemporary?    Yes    No

If no, why? \_\_\_\_\_

Is this typeface a noticeably new design approach?    Yes    No

If no, why? \_\_\_\_\_

Does this new typeface have a strong high tech and high fashion feeling?    Yes    No

If no, why? \_\_\_\_\_

Do you think the proportions between letters, consonants and vowels are correct when they are together in a word or sentence?

Yes    No If no, why? \_\_\_\_\_

*Intermediate Evaluation Summary continued*

---

The intermediate evaluation forms were given to 20 Thai students in RIT, both designers and non-designers.  
The main problems of the final sketches are summarized below.

Problem 1) Similar letters are difficult to distinguish from each other as shown in the following example:

ข ข ค ค ง ง  
ก ก ท ท น น

Problem 2) The size of the vowels composing the words and sentences are proportioned too small in comparison with other letters.

ทกขเรีจรบแต่จ่าใจไปฟอบทงองไมจิมพ์น?

เสขเจ้าทักคทบนำแต่ตองไปฟอบทักคทบ?

ฟอบทักภาษอังกฤษ·ไมจำกัด

ฟอบทักภาษาไทย·ไมพอ?

เครื่องมื่อใหม่ของกราฟิคไทยปี๒๐๐๐

**Refinement**

Thai Alphabet: Final Approach

ก ข ฃ ค **ค** ฅ ง จ  
ฉ ช **ซ** ฌ ญ ฎ **ฏ**  
จุ **ท** ฒ ณ ด ต  
ถ ท ฐ **บ** ป ฝ  
**พ** **พ** ฝ ฝ ฝ ฝ **ย** ษ  
ฮ ต ฏ ศ ษ ส  
**ห** ฬ ฌ ฌ

Thai Alphabet: Refinement

ก ข ฃ ค **ค** ฅ ง จ  
ฉ ช **ซ** ฌ ญ ฎ **ฏ**  
จุ **ท** ฒ ณ ด ต  
ถ ท ฐ **บ** ป ฝ  
**พ** **พ** ฝ ฝ ฝ ฝ **ย** ษ  
ฮ ต ฏ ศ ษ ส  
**ห** ฬ ฌ ฌ

***Ideation, Implementation***

---

### ***Applying the New Typeface***

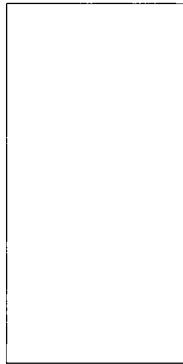
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Typography is often one of the most important elements in any design work. It can communicate, distinguish or even reflect a particular time period. Three posters have been designed to simultaneously expose current problems in Thai typographic design and promote a new typeface option for Thai graphic designers as well as test the new typeface in different situations from simple to complex. The proportion of the posters are rectangular, 12"x 28"

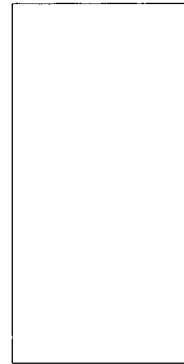
***Poster 1***



***Poster 2***



***Poster 3***



***Goal***

*Simple  
Type / Image  
Integration*

*Medium  
Type / Image  
Integration*

*Complex  
Type / Image  
Integration*

***Current Problem in Thai***

*For a wide range of products usage of a few typefaces, causing the products to have no distinction or character*

*Thai designers still use out-of-date typefaces with contemporary layouts*

*Limited choices of Thai typefaces, compared to the western typefaces*

***Proposed Solution***

*New typeface is designed to have certain characteristics that could communicate specific topics such as fashion and high technology products*

*New typeface was designed to have a contemporary, futuristic feeling within a simple geometric shape.*

*A new typeface which increases options for use on design applications*



## Headlines

---

The headlines were developed by focusing on three main problems of typeface usage in Thailand. These headlines will urge Thai designers to realize that it is time to have a new typeface and that they should not limit themselves with the existing Thai typefaces.

### **Poster 1 Headline**

"The same font to sell warships and toothpicks?"

The few available options for Thai display typefaces are used for a wide range of products. Therefore, this poster uses the Thai proverb "from warships to toothpicks", meaning from big to small, from complex to simple. This poster implies that products could be more specifically communicated. One important factor in this process would be typeface selection.

### **Poster 2 Headline**

"Contemporary layouts confined to prehistoric fonts?"

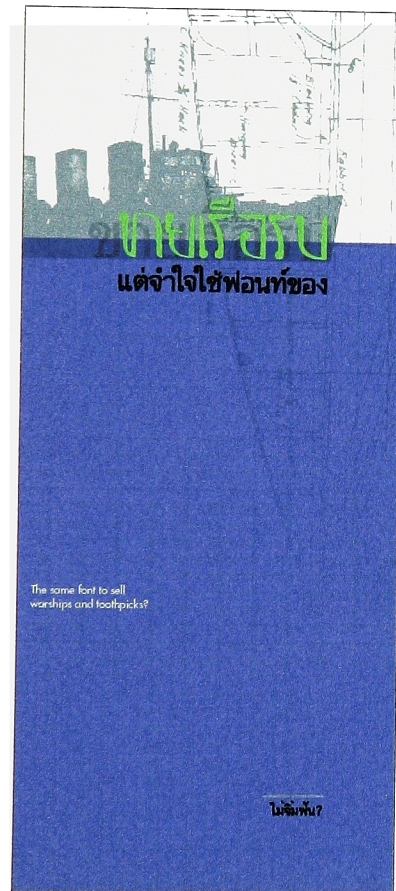
Thai designers are confined to existing, often outdated typefaces. New Thai typefaces are rarely developed. This poster suggests that the development and use of new typefaces would help to update Thai graphic design in its reflection of today and tomorrow.

### **Poster 3 Headline**

"Unlimited English fonts, Limited Thai fonts?"

Since there are only a few typeface options for Thai designers, type usage and experimentation are limited. This poster emphasizes the contrast between the abundance of available Western typefaces and the very limited selection of Thai typefaces.

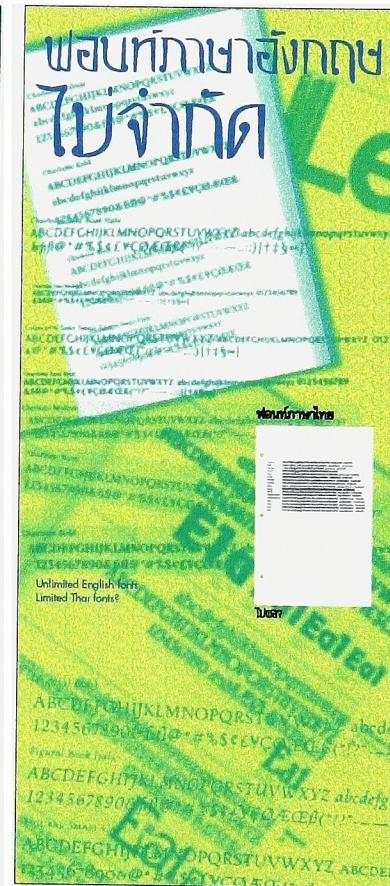
Final Posters



Poster 1



Poster 2



Poster 3

## ***Dissemination***

---

### ***The First Level: Short Term***

---

So far, the distribution of this project has been through the small scale posters and process panels. The attempt is to introduce Thai letterforms and facts about the development of Thai language. These posters / panels are reduced reproductions of originals that were created for use in the graduate thesis exhibition when the new Thai typography was shown in Bevier Gallery. The following text was included in the distributed materials.

“Thai means free and never occupied. Thailand has never been occupied by another country and has had its own culture and language for almost two thousand years. The Thai language was created by King Ramkhamhangmaharatch, the second king of Sukhothai which was the first Thai kingdom. At first, Thai borrowed some words and letters from Kmer which is now Cambodia. Thai language has gradually been changed and adapted by Thai people. Over this long period of time, Thai letterforms have developed to be completely different from the original Kmer letterforms. Thai is composed of 44 letters, which are used as consonants and syllables, 32 vowels, 10 numerals and 5 tones.

Although Thai typefaces have been in existence for a long time, designers have not really been involved in their development. Thai type design has been developed by printers. If typeface development progresses in Thailand as it has in the West, it will reflect more experimentation. It is my hope that Thai typography will continue to evolve and adapt to the needs of contemporary Thai designers.”

### ***The Second Level: Long Term***

---

In the future, this Thai typeface will be developed for more functional purposes. As has been previously stated, some Thai typefaces had either only one line weight or a maximum of four line weights. On the other hand, this new typeface will have more than one line weight for appropriate usage in different situations. The typeface must be produced in the form of a postscript file for the actual usage. For the series of posters which were designed for promoting the new typeface the content in the posters pointed out the main problems of the Thai typeface usage. Hopefully, this project will encourage Thai designers to look back and realize the importance of Thai typography development.

## ***Conclusion***

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### ***The New Thaipography***

---

This project, The New Thaipography, is an attempt at solving some of the existing problems of Thai typefaces. The project started from the need to design a new Thai typeface. According to the documents from Thailand, there are very few Thai typefaces which Thai designers are using. Moreover, Thai typefaces are rarely created by designers, but mostly by printers. Therefore, The New Thaipography was created to be functional as well as beautiful.

When designing the first stages of the new typeface, different sketches were made in order to cover a wide range of designs. It is also important to take the audience into consideration for the purpose of this new typeface. The first evaluation tested 20 Thais (10 designers and 10 non-designers). As a result, the typeface with the most Thai recognition was chosen. Two other considerations used for the second set of sketches were legibility and overall contemporary feeling. In summary, the font was designed by emphasizing the head and other distinctive characteristics of each letter. Its functions as well as its characteristics were also concerns.

The posters are an application to present the new typeface. Headlines were created at the same time the new typeface was being designed. The headlines describe the problems of the existing Thai typeface usage. The first headline was presented by using a Thai proverb, while the second and third headlines directly addressed real problems. The posters were a way of testing the new typeface on real media. These posters, from the first to the third, ranged from simple to complex.

Two explanation panels were designed for the thesis exhibition. One panel showed the process of the project while another showed the new typeface as applied to the poster. Non-designers are interested in the process of development and evaluation. Due to cross cultural differences, the first poster, containing the Thai proverb, draws attention from many people. Although the headline is a Thai proverb, people can perceive the differences between warship and toothpick. The first poster is a strong reflection of Thai culture. Posters 2 and 3 are not based on Thai proverbs. If these poster solutions were to be reconsidered at sometime in the future, they would also be based on Thai proverbs.

This project has many lengthy processes, especially evaluation. Evaluation is the most important because the new typeface must be judged and recognized by Thai people based on Thai standards. Western theory and principles were applied to the design of this typeface in order to embody the best characteristics of these principles and theories. This project has gained directly from stages of the design process such as researching, analyzing, synthesizing, concept developing and evaluating. Learning how to apply principles and theories from one culture to another culture has also been a valuable experience.

## ***Glossary of Terms***

---

### ***Ascender***

Stroke on a lowercase letter that rises or ascends above the meanline.

### ***Basic Structure / Anatomy***

The main or important structures of the letter.

### ***Bit-map***

A computerized image made up of dots. These are mapped onto the screen directly from corresponding bits in memory (hence the name). Also referred to as paint format.

### ***Contour***

The outline of a shape.

### ***Counterform***

Negative spatial areas defined and shaped by letterforms, including both interior counters and spaces between characters.

### ***Descender***

Stroke on a lowercase letterform that falls or descends below the baseline.

### ***Display Type***

Type sizes that are larger than 12 point type; generally for headlines, main headlines.

### ***Em***

The square of the body size of any type, used as a unit of measure. In some expanded or condensed faces, the em is also expanded or condensed from the square proportion.

### ***Figure and Ground***

Figure is a positive shape (usually black) on a ground or background (usually white).

### ***Grid***

Underlying structure composed of a linear framework of lines used by designers to organize typographic and pictorial elements. Also, a film or glass, containing characters in a predetermined configuration used in phototypesetting.

### ***Legibility***

People can acknowledge or notice and understand individual letterforms.

### ***Interletter Spacing***

The spatial interval between letters, also called letterspacing.

### ***Interline Spacing***

The spatial interval between lines, also called leading (origin: lead slugs used to separate lines of type in traditional metal moveable type).

### ***Interword Spacing***

The spatial interval between lines, also called word spacing.

### ***Modern***

Term used to describe typefaces designed at the end of the eighteenth century. Characteristics include vertical stress, hairline serifs, and pronounced contrasts between thick and thin strokes.

### ***Negative***

The reversal of a positive photographic image; also a photographic film negative.

### ***Pica***

Typographic unit of measurement: 12 points equal 1 pica. Six picas equals approximately one inch. Line length and column widths are measured in picas.

## ***Glossary of Terms***

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### ***Point***

A measure of size used principally in typesetting. 12 points equals to a pica, or approximately 1/72 of an inch. It is most often used to indicate the size of type or amount of space between lines.

### ***Readability***

The degree to which an entire composition, text and images, is comfortable and easy to read.

### ***Recognition***

Shapes of letters and words must be distinguishable and continuous text can be read accurately, rapidly, easily and with understanding.

### ***Text Type***

Typeface sizes that range from 9 to 12 points; generally for prose text.

### ***Typography***

Originally, the composition of printed matter from moveable type. Now the art and process of typesetting by any system or method.

### ***Sans Serif***

Typefaces without serifs; sans is French, meaning 'without'.

### ***Serifs***

Small elements added to the ends of the main strokes of a letterform in serified type styles.

### ***Syntax***

In grammar, the way in which words or phrases are put together to form sentences. In design, the connecting or ordering of typographic elements into a visual unity.

### ***x-height***

The height of lowercase letters, excluding ascenders and descenders. This is most easily measured on the lowercase x, from baseline to meanline.



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## ***Appendices***

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### ***Hand Composition***

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The traditional method of setting foundry type by hand is similar to the method used by Gutenberg when he invented movable type in 1450. Hand composition was accomplished by assembling individual pieces of type on a line. Type was set letter by letter, line by line, until the setting was achieved. When it was necessary to justify a line, additional spaces were created in the line by inserting metal spacing between the word. Letter spacing was achieved by inserting very thin pieces of copper or brass between letters until words appeared to be evenly spaced. When additional space between lines was desired, strips of lead were inserted between the lines until the type column was the proper depth. By adding lead, the exact proportion and size of the column could be formed, assuring readability through consistent spacing. Types were set and locked in a heavy rectangular steel frame called a chase. This was done on a table called a stone. The type was surrounded by wood or metal spacing material, called furniture. After the type was secured in the chase, it was ready to be transferred to a press for printing. The Hand composition was tedious and time consuming. When Linotype and Monotype machines were invented, hand composition was only used for displaying typesetting in small amount.

### ***Monotype***

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This is another leading automated typesetting which was invented by Tolbert Lanston in 1887. This machine cast one character at a time rather than an entire line. It was composed two parts: a keyboard and a typecaster. When typing on the keyboard, a perforated paper tape was generated. This coded tape was used for driving the second part of the system, the typecaster. Compressed air, blown through the punched holes of this revolving spool of coed paper, determined which characters would be cast by a typecaster. Actual casting of type occurred when hot metal was forced into matrices from the matrix case. When the cast characters had cooled, they were placed into a metal tray called a galley, where the lines were assembled. Monotype lines could reach a maximum length of about 60 picas.

Monotype became an efficient way to set the type for several reason. Corrections are made by changing individual letters instead of complete lines. Therefore the complex typesetting, such as scientific data and tabular information, was easier. The Monotype matrix case held many more character than a Linotype magazine, and casting machine was relative fast, casting 150 characters per minute. Since the system consisted of 2 separate machines, an operator could generate type away from the clatter of the casting machine. In fact, several operators could keyboard in the information for later setting.

### ***Linotype***

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One of the most profound developments in typesetting technology was the invention of the Linotype machine by Ottmar Mergenthaler in 1886. This machine is the first step toward typographic automation. It produced a single line of type to a predetermined length specified by the keyboard operator.

The operation of Linotype was based on the principle of a circulating matrix. Each time a key was pressed, a single brass matrix was released from an overhead magazine, divided into ninety vertical channels, each containing matrices for one character. The magazine was the character storage case for the machine. Once an entire line had been typed, the matrices moved into an automatic casting mechanism where the line of type was cast from molten lead. As each line was being cast, the operator typed the next line. After the casting process was complete, cast lines of the type called slugs were ejected from the mold, and the matrices were automatically returned to their appropriate slot in the magazine for reuse. This typesetting were obviously after and more accurate. Justification of type was automatic, eliminating the tedious process of inserting spaces between letters and words. A standard Linotype could cast lines up to 30 picas in length.

The development of linecasting type was the Teletypesetter. This perforated tape-driven machine, an attachment to Linotype and intertype, was introduced in 1928. Tape, which was punched by a machine similar to a standard typewriter, could be generated from a distant location and transmitted to the linecaster by wire, which made the machine invaluable to news service.

### ***Ludlow***

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Ludlow, a semiautomatic linecaster, is another machine of the development of automated typesetting. Unlike the Linotype and Monotype, the Ludlow did not have a keyboard but combined both hand and machine production. An operator took matrices from a matrix case similar to a hand set type case and placed them into a special composing stick, one by one. The stick would automatically justify or center lines by inserting blank matrices where necessary. When a line of matrices was assembled, it was placed into a casting device where automatically cast into slugs. If a correction was necessary, matrices were inserted into the stick, cast, locked up, and printed. Although partially automated, this process was time consuming. Distributing the matrices back into the type case by hand added to the production time. Type produced by the ludlow machine ranged from 6 to 144 point. Its major use was to produce display type for headlines and other purposes requiring larger typefaces. However the Ludlow was neither practical nor efficient for setting large volumes of type.

### ***Phototypesetting***

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The phototypesetting had been done as early as the 1880s. This new form of typesetting was fully recognized not until World War II. Printing technology advanced from letterpress to photographic process of offset lithography. Phototypesetting and digital typesetting are currently the primary methods of setting type in the graphic art. Since the development of Intertype's Fotosetter and Mergenthaler's Linofilm, the first generation of keyboard phototypesetters, introduced in 1950. Phototypesetting can be divided into two basic classes: photo-optical systems and photo-scanning systems.

#### ***Photo-Optical Systems***

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Photo-optical systems store characters in the form of a master font on film, discs, grids, stirps, or drums. These negative images are the matrices of phototypesetting systems. They are optically projected onto photographic film or paper. A variety of sizes of type can be obtained from a single master font in most systems. An operator enters text and specifications at an editing to control this typesetting process.

#### ***Photo-Scanning Systems***

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Photo-scanning systems store characters in the form of a master font, not unlike those of photo-optical systems. However, character are not photographically projected onto film or paper, rather, they are scanned electronically and broken down into either dots or lines. These digitized characters are projected onto a cathode-ray photographic paper or film. When characters have been digitally generated, their appearance can easily be altered. Weight, width, and slant can be changed automatically. Photo-scanning systems operate at much higher speeds than photo-optical systems.

### **System Components**

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Typically, a phototypesetting system is composed of 4 parts, which are input, output, editing, and storage functions.

#### *Keyboard and visual display terminal (VDT)*

Copy is typed at the keyboard and viewed on the VDT. Although keyboards vary from one system to another, their basic function is to enter and edit text. While a phototypesetter keyboard is similar to a typewriter's keyboard, additional keys are provided to perform special functions. The editing capabilities of a terminal save considerable time and effort. Words, lines, and paragraphs can be added, deleted, and moved from one area of the screen to another with ease. Changes can be made at the keyboard before type is processed.

#### *Storage area*

Storage is very important part of the editing system of a phototypesetter and may or may not be a part of the VDT. Input is stored temporarily in the computer's memory or permanently on a magnetic disk or on tape. If at a later date the type needs to be altered, the contents of the disk or tape are simply loaded into the computer and changes are made at the keyboard.

#### *Computer*

This component, which is connected to VDT, relays signals between the keyboard, the screen, memory, photo-unit, and processor.

#### *Processor*

After type has been set, the exposed film or paper is developed in a photographic processor. This may be a part of the typesetter, or it may be a separate unit. A machine that combines all component into one unit is called a direct-entry phototypesetter. These machines are very popular for a number of reasons. They are small, affordable easy to operate, and capable of handling difficult typesetting demands. Since input and output are shared by a single unit, direct-entry machine can be used as a word processor and editing terminal that produces high-quality type. Some unit can connect with other word processing terminals, enabling input from more than one operator. Other units have full-page display capabilities. Called area composition terminals, these units enable complete page makeup and presentation on a visual display terminal. Phototypesetting systems can be part of complex and extensive networks, with links to word processors and mainframe computer. Text generated at one location can be transferred to another via telephone modem or satellite. The phototypesetting are highly flexible and very fast. It can set 500 characters per second. Type generated from a phototypesetting system takes up very little physical space because its final form is a film or paper proof. Moreover, text input uses computerized editing capabilities, which speeds up the process of the entering the text considerably, as corrections are made electronically at the keyboard. The phototypesetting makes flexibility in the spacing of typographic elements through kerning, letterspacing, overlapping, interline spacing, and special effect such as run around. Therefore, if a designer can understand the capabilities of the phototypesetting, it can be used to a greater advantage.



### ***Display Photographic Typesetting***

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A rapid increase in the use of display phototypesetting occurred during the 1960s. As with keyboard phototypesetters, a light source projects the image of a letterform from the film font through a lens system onto photographic paper or film. There is no keyboard, each character from the film is brought into position by operator using hand controls. Because the operator is able to see the recently set characters as they develop photographically, letterspacing can be precisely controlled. This process became the method of headline typesetting. Instead of being bound by the sizes of handset composition, the designer can specify any enlargement or reduction of the master font, with perfect sharpness. Moreover, display phototype offers an unlimited supply of characters. Also spacing flexibility, display type could overlap, touch and be set at any interletterspacing, which are specified by the designer. The lens system can distort letterform. Characters can be expanded, condensed, italicized and even backslanted. The metal typefaces, requiring punches, matrices, cast letters, are replaced by one film font. Therefore, the introduction of the new typefaces and revival of earlier styles greatly increased.

### ***Digital Typesetting***

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The digital computer combines with the high resolution cathode-ray tube (CRT) and laser. Because digital computers have no mechanical parts and are entirely composed of electronic components, they set and process type at much higher speeds. In addition the text type from digital typesetters has been developed to rival the quality of phototype.

A digital computer is an electronic device that uses electricity to process information. It can perform repetitive logical and arithmetic operations in memory. The computer is composed of hardware, software and firmware. Hardware consists of the physical components of the computer; software is the program data which controls the operation of the hardware; firmware is software in hardware form. The computer component controls all other parts, performs logic operations, and stores information in the center processing unit (CPU). All components that do not belong to the CPU are called peripherals. A typical digital typesetting system is composed of a CPU and various peripherals that perform functions necessary to the setting of type—for example, editing and storing text, displaying text on screen, and printing typeset copy.

A CPU consists of 3 interdependent components: arithmetic-logic unit (ALU), main memory, and control unit. These three components work together to control the operations of the computer. The ALU performs both arithmetic and logical functions such as adding 2 numbers together and determining which of two numbers is the greatest. In the main memory, called the randomaccess memory (RAM), data is stored and retrieved by the control unit. This unit also controls the functions of ALU and RAM. Consisting of three parts, the CPU is the brain of a computer. It controls all functions, including the generation and setting of type in a digital-typesetting system.

A digital-computer system is based on the bicondition state of electronic circuitry. An electronic line can exist in only one of two states: it is either on or off. Each on/off state represents on binary digit or bit, enabling a computer to operate within the laws of the binary-number system. The binary system is base-2 numbering system using only two numbers, 0 and 1. These numbers coincide with the biconditions: off and on, respectively. The binary system is the exclusive language of any digital computer. A computer communicates and processes information through the use of data structures. These are bits that have been grouped together into various configurations large enough to store significant information. The smallest bit structure is a byte, which consists of a group of bits linked together, such as the ASCII code (American Standard Code for Information Interchange, an information code in which the numbers 0 to i27 represent alphanumeric characters on the keyboard). These data structures are binary codes representing characters or numbers. Translating our alphanumeric characters into the binary system enables computers and people to communicate. In digital typesetting, when the operator punches a key to enter a letter or issue a command (such as line length or paragraph indent), the computer receives it as a binary code. When information has been entered, it can be stored, edited, and sent to a peripheral device for typesetting. A digital typesetting system encodes typographic characters digitally on grid, defining the shape of each character as a certain number of distinct points. Every detail of letter is defined, including horizontal strokes, vertical strokes, and curves. The coded characters are stored electronically as digital instructions designating the x and y coordinates of the character on the grid. The instructions are then set to a CRT, where the character is generated onto the system

***Digital Typesetting*** *continued*

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A CRT is much like a television set. It has a vacuum tube with a cathode at one end and a plate of phosphorus and aluminum at the other. When the CRT receives the digital instructions from the computer, defining the shape of the characters, the cathode emits a beam, which scans the tube in a series of parallel back-and-forth sweeps. The cathode beam is programmed to be either on or off, depending on the design of the letterforms that have been digitally encoded into the computer. When the beam is on, it excites the phosphorus and aluminum plate. The light emitted by the plate defines each character being typeset. The type is then digitally exposed to photographic paper.

The level of resolution in digital letterforms is an important consideration. Basically, the more dots or lines used to describe a letterform, the higher the resolution becomes. Because letters are constructed on a grid, the curved line consist of a series of stair-stepped contours. When more dots are used to represent a curve, the curve appears smoother to the eye. Large characters require more dots than do small characters to achieve a refined appearance. The quality of a letterform is determined not only by its original design, but also by its digital resolution. The designer of digital type must consider digital technology and its effect on the resolution of letterforms.

One major difference between digital type and phototype is the manner in which type is stored. Rather than storing master fonts on photographic disks, drums, grids, or strips, digital master fonts can be stored electronically as bit patterns on a magnetic disk. Some machines are capable of storing hundreds of fonts, with each size stored independently.

***Scanning and Laser Systems***

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There are 2 classes of digital typesetters: digital scanning systems and digital-laser systems. In digital-scanning systems, photographic characters are digitally scanned and recorded electronically on a magnetic disk or tape. The characters are translated into a grid of extremely high resolution and transmitted as a set of instructions to a CRT. The characters are generated onto the CRT by series of scan lines. The letterform images are projected from the CRT onto paper, film or an electronic drum. Because the output type is digital, it can be modified automatically to reflect a number of typographic variations. For example, it can be made heavier, lighter, slanted, condensed, or expanded to the command of the operator.

Digital-laser systems also store characters digitally, but do not employ a CRT to generate characters. A laser beam scans photographic paper as it reads digital information stored in the typesetter. As the paper is scanned, a series of dots forming the characters are exposed to the paper. The information controlling the laser includes the typographic font and spacing, such as hyphenation, justification, kerning, and letterspacing.

Because digital typesetters are so fast, it is particularly suited to industries requiring the processing of enormous amounts of information, such as news services and publishing companies. However, smaller offices and type houses are also using digital type because of its efficiency.

Direct-entry digital typesetters are similar to direct-entry phototypesetters, for they are both self-contained. However, direct-entry digital typesetters are much faster and more versatile. Because they generate modified characters and a wider range of sizes and spatial intervals, direct-entry digital typesetters bring greater

### ***Electronic Page Design***

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Digital typesetting moved onto designer's desktop with development of powerful personal computers and software applications during the last decade. This major leads to typographic technology and possibility of designing entire pages on a computer screen, then electronically output them on paper, film, or even printing plates. Electronic page design, called desktop publishing, eliminates the need for paste up, which is the hand assembly of elements in the position for reproduction as a page. Type size, style, spacing, and position can be changed, then viewed on the screen immediately, bringing the freedom to typographic design. Advances in technology are bringing typography closer to what you can see is what you can get. The image on computer is identical to the image when printed final output.

#### *Hardware Component*

Hardware, the physical component of the system, consists of the computer and the peripheral devices that connect to it. Available peripherals include input devices, which are used to feed information into computer, and output devices, which produce the final product.

#### *Central Processing Unit*

This electronic microprocessor chip does the actual work of the computer by receiving, processing, and storing information. It functions in a manner similar to the CPU of a digital typesetter.

#### *Input Devices*

Theses generate information for processing by the CPU and display on a screen, which uses a cathode-ray tube to produce a visual display of data. The keyboard contains alphabetical and numeric keys to input data. In addition, it contains special keys to perform specified functions, such as arrow keys to direct a pointer around the screen and a command key that is held down while other keys are pressed, enabling them to send commands to computer. The mouse is a hand-held device that is moved about the desktop; it controls the movement of the pointer on the screen. A button on the mouse is clicked on elements to select them. When the mouse button is held down, elements on screen can be moved by moving mouse. Graphics tablets operate in a manner similar to a mouse, but use a stylus or pointer touched to a flat surface information. Scanners are devices which convert images or text into digital form so that they can be stored and manipulated by the computer.

#### *Information Storage Devices*

A disk is a round platter with a magnetic coating similar to recording tape, on which information from computer is stored in the form of magnetic impulses. A disk drive reads information form, and writes information on disks. Floppy disks is portable and housed in a 3.5 inch hard plastic case. Hard disk drives have large rigid disk permanently mounted within the computer or in a separate case. Hard disks have a large storage capacity and fast operating speed. Removable hard disk cartridges combine the portability of floppy disks with the large storage capacity hard disk drives. The development of new information storage devices using compact disks and optical, rather than magnetic, systems promises even greater speed and storage of massive amounts of data.

**Electronic Page Design** *continued*

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*Output Devices*

After a design is completed, output devices are used to convert the screen image to printed output. A dot matrix printer composes characters and image into a pattern of dots. The measure of quality for typographic output is the number of dots per inch (dpi); this determines the resolution of the image. A pin-strike against an inked ribbon, transferring dots of ink on paper to form the image. Many pin-strike printers have 72 dpi resolution, identical to the dpi of low-resolution screens.

A laser printer creates images by drawing them on a metal drum with a laser. Dry ink particles are attracted to this image, which is then transferred to paper in a process similar to a photocopying machine. The first-generation laser printers' 300 dpi resolution was called 'near typesetting quality'. The ability of laser printers to output pages combining text and images was made by the development of interpretive programming languages that provide a software interface between page design programs, discussed below, and output devices. The first page-description programming language, Postscript by Adobe systems, Inc., was specific and their position on the page; QuickDraw by Apple Computer is another programming language that enables the rapid display of typographic elements on a screen.

Imagesetters are high-resolution output devices that consist of two components, a raster image processor (RIP) and a recorder or exposure unit. The RIP is a computer that uses a page-description language to convert the data files from the designer's workstation into an electronic pixel pattern of the page. Every single point on the page, whether part of a letterform or a pictorial image, is positioned in this pattern, which is sent to exposure unit as a bit-map of raster lines. A bit-map is a computerized image. Exposure units from various manufacturers use different technologies, such as cathode-ray tube (CRT), gas laser, laser diode, or light-emitting diode (LED), to record the RIP-composed page on photographic paper or film, plain paper, or even a printing plate.

Imagetypesetters produce very high resolution 1270 or 2540 dpi output. Imagesetters output type and halftone images in their final reproduction position, and some can output color separation negatives as well. The speed of digital typesetters is rated in inches per minute since they output an entire bitmapped page. Early imagesetters were not capable of the typographic refinement of digital typesetters; however, steady improvement in hardware and software has closed the gap in quality. Imagesetter output of electronically designed pages has rapidly replaced traditional composition and paste up.

Many typesetting firms have service bureaus to offer imagesetter output for their clients, large advertising agencies and graphic-design offices have installed imagesetters with their firms. Typefaces are stored electronically in either bit-mapped or outline data form. Bit-mapped fonts are made up of dots and usually require a separate data set for each size of the typeface. Outline of each character, using bezier curves to draw non-uniform curves. Bezier curves are defined by 4 points, and their use enables computers to generate smooth images of complex letterforms.

**Electronic Page Design** *continued*

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*Software*

The instructions that tell the computer what to do are called software. An application program is software used to create and modify documents. The principle types of applications used in typographic design are word processors, drawing and painting programs, and page-layout software. Word-processing programs are used to type in text, then edit, change, move or remove it. Word processing software can check grammar and spelling and suggests synonyms. Most text is written with a word processing program, then transferred to page layout program for design.

Drawing, painting programs are used to create images. Early paint programs created images as a series of bit-mapped dots, while drawing programs generated objects that are treated as mathematically defined line and arc segments rather than a series of dots. A rectangle created in a paint program can have its corner erased, but in order to move it, all the dots composing it must be selected; by contrast, an object-oriented rectangle can be selected by clicking anywhere on it, then moving about the space. However, you can not erase or change details. Most drawing and painting programs can generate and manipulate type, and advanced versions often combine the features of object-oriented draw programs along with bit-mapped paint programs.

Page-design programs are used to design pages of typography and combine images with them. The type font, size and leading can be selected, and text type can be flowed into columns running from page to page. Elements can be moved about the page, and templates of grid lines and standard repeating elements such as page numbers can be established. The screen image provides immediate feedback about the page design since all elements are visible in their final sizes and spatial change. The paper or film output in final form, ready for reproduction.

The differences between word processing programs and page design programs are decreasing as each incorporates features from the other in updated version. In general, word processing programs have greater control over the editing process, while page-design programs have greater control over page composition. For example, in page design programs an element can be selected with the mouse and moved anywhere on the page, but word processing programs do not have this capability. Page design programs were made possible by the development of interpretive programming languages that provide software interface between page-design programs and output devices. The new computer graphic technology has rapidly expanded the range of typeface design as well, for type design programs permit more development of a new font than earlier technologies.

***Electronic Page Design*** continued

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*The User Interface*

A typographic designer's computer workstation has an intuitive user interface; this means the tools are easy to use, permitting the user to focus on the task at hand. A desktop paste up metaphor is employed. The user sees the page surrounded by a desktop where elements can be created, held to one side, and then placed into position on the page. This metaphor to traditional paste up has made it easier for the designers accustomed to traditional methods to design and assemble pages.

In page design programs, a menu bar across the top of the screen lists major titles. The user moves the mouse to place the pointer on an item on the screen to be changed, then selects it by clicking the mouse button. The pointer is placed on a menu title, and the mouse button is clicked, causing a list of commands to pop down. Under the type menu in one page design program, for example, a list of commands for making changes to type that has been selected pops down. The user can change the type style, size, color, or alignment. Page layout programs also have a palette of tools that are represented by icons. After a tool icon is selected, the mouse is used to perform that operation.

Advanced page design programs permit unprecedented flexibility in typographic design. Minute adjustments of typographic spacing are possible. Type can be set in sizes from 2 points to 720 points and leaded from -1080 to +1080 points. Letterspacing can be controlled by manually kerning in increments of 1/20 or 1/200em. The user can create kerning tables that automatically kern letter pairs. Tracking can be edited by selecting a range of characters, then changing the tracking in increments of 1/20 or 1/200 em as well.

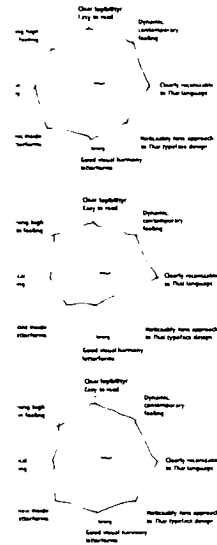
Many programs provide the designer with unique capabilities for the manipulation and distorting of typographic forms. Lines of type can be joined to circular, oval, or irregular baselines; letterforms can be stretched and distorted in numerous ways. Page design programs compose elements on a page in layers, so elements can be overlapped and layered in space. These electronic page design capabilities are a mixed blessing, for while they can also produce awkward spatial arrangements and typographic forms that are hard to read.

Appendices

***B: Preliminary Evaluation***

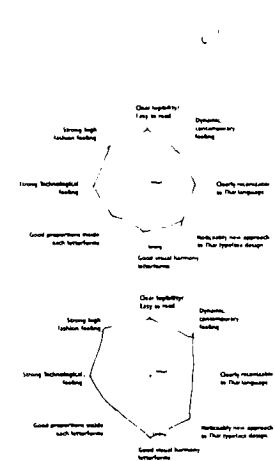


Name: Amir Amir  
Major: Graphic Design Age: 21



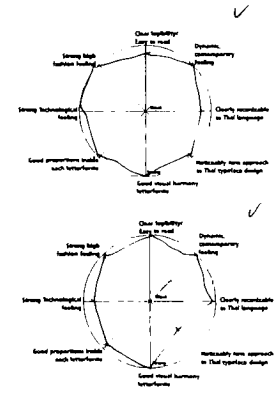
Other suggestion

Name: Amir Amir  
Major: Graphic Design Age: 21



Other suggestion

Name: Amir Amir  
Major: Graphic Design Age: 21



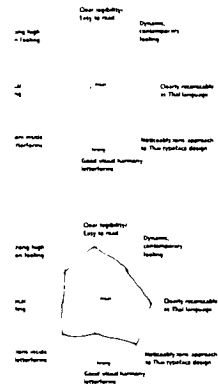
Other suggestion

Other suggestion

10 (value)

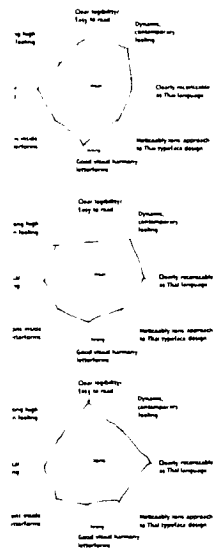


Strong



Other suggestion

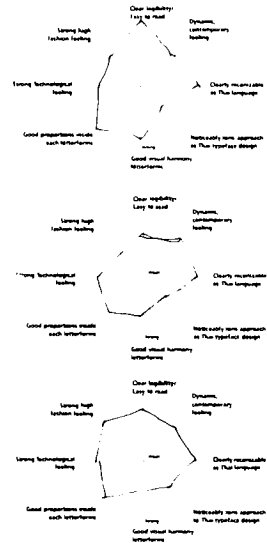
Name *John Doe*  
Major Age



Other suggestion

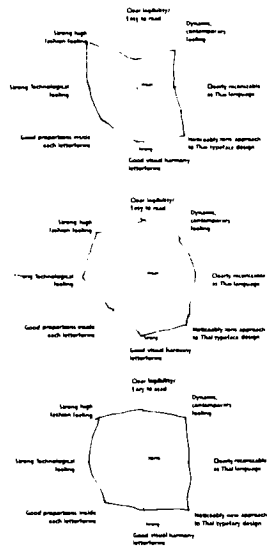
Name  
Major

Age

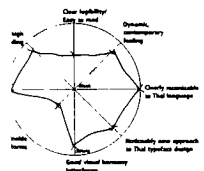


Other suggestion

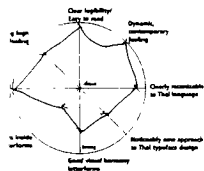
Name *John Doe*  
Major Age



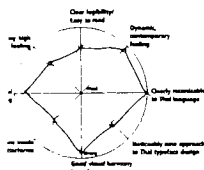
Other suggestion



Brnk

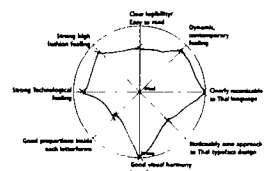


Brnk

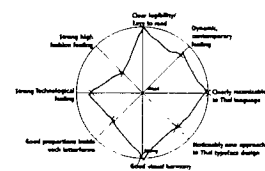


Brnk

Other suggestion



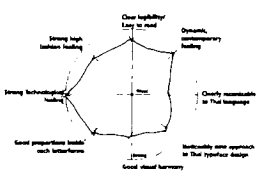
Brnk



Brnk

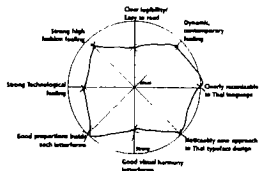
Brnk

Other suggestion



Brnk

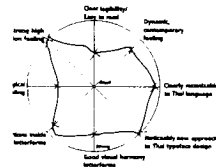
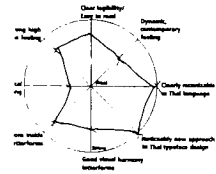
Brnk



Brnk

Other suggestion

to evaluate



Name Bomb  
Major University Age 18

WAVE

WAVE

Other suggestion

Name Bomb  
Major University Age 18

WAVE

WAVE

WAVE

Other suggestion

Name Bomb  
Major University Age 18

WAVE

WAVE

WAVE

Other suggestion

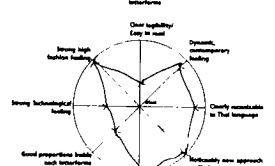
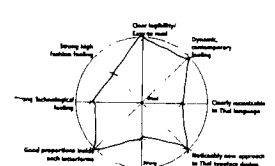
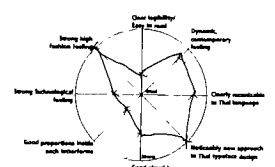
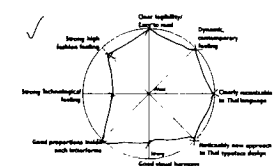
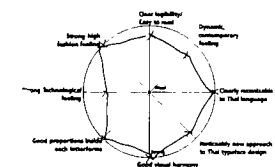
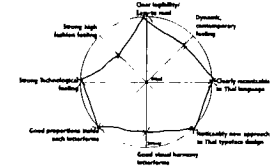
Name Bomb  
Major University Age 18

hard to read (hardest)  
WAVE

WAVE

WAVE

Other suggestion



Name: J. F. S. 1  
Major: MATHS 101 Age: 18

Clear legibility  
Easy to read  
Dynamic, contemporary  
feeling  
Clearly recognizable  
in the language  
Helps easily read approach  
to this typeface design  
Good visual harmony  
with the typeface design  
Clear legibility  
Easy to read  
Dynamic, contemporary  
feeling  
Clearly recognizable  
in the language  
Helps easily read approach  
to this typeface design  
Good visual harmony  
with the typeface design

HEIKS FUNNY (like you!)

HEIKS FUNNY (like you!)

Other suggestion  
HEIKS FUNNY (like you!)

Name: J. F. S. 1  
Major: MATHS 101 Age: 18

Clear legibility  
Easy to read  
Dynamic, contemporary  
feeling  
Clearly recognizable  
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to this typeface design  
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with the typeface design  
Clear legibility  
Easy to read  
Dynamic, contemporary  
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Helps easily read approach  
to this typeface design  
Good visual harmony  
with the typeface design

HEIKS FUNNY (like you!)

HEIKS FUNNY (like you!)

HEIKS FUNNY (like you!)

Other suggestion  
HEIKS FUNNY (like you!)

Name: J. F. S. 1  
Major: MATHS 101 Age: 18

Clear legibility  
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Good visual harmony  
with the typeface design  
Clear legibility  
Easy to read  
Dynamic, contemporary  
feeling  
Clearly recognizable  
in the language  
Helps easily read approach  
to this typeface design  
Good visual harmony  
with the typeface design

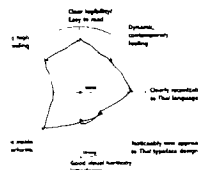
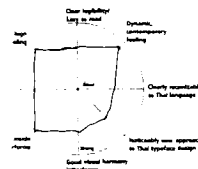
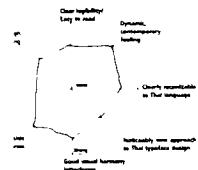
HEIKS FUNNY (like you!)

HEIKS FUNNY (like you!)

Other suggestion  
HEIKS FUNNY (like you!)

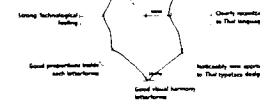
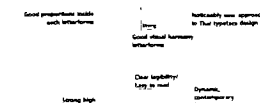
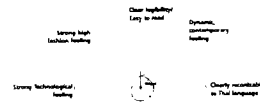


Name *Leif*  
Major \_\_\_\_\_ Age \_\_\_\_\_



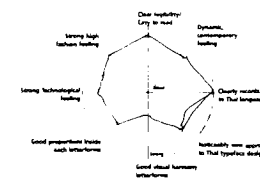
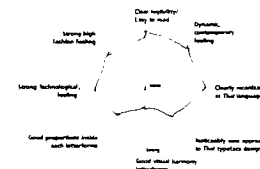
Other suggestion

Name *Leif*  
Major \_\_\_\_\_ Age \_\_\_\_\_



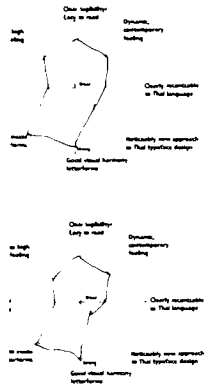
Other suggestion

Name *Leif*  
Major \_\_\_\_\_ Age \_\_\_\_\_



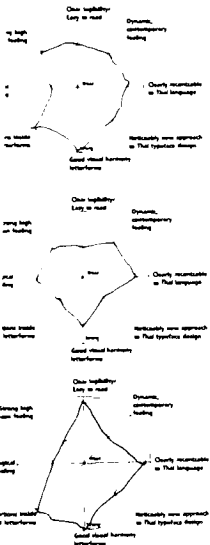
Other suggestion

evaluate



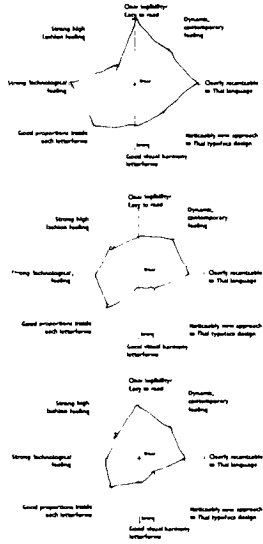
Other suggestion

Name: *Satit*  
Major: *Architecture* Age: *22*



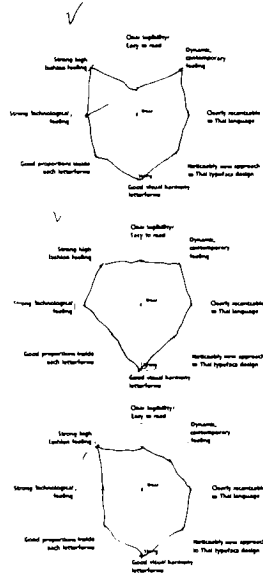
Other suggestion

Name: *Satit*  
Major: *Architecture* Age: *22*



Other suggestion

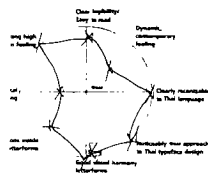
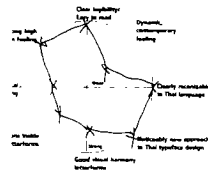
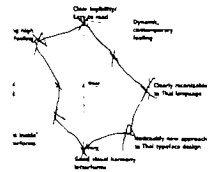
Name: *Satit*  
Major: *Architecture* Age: *22*



Other suggestion

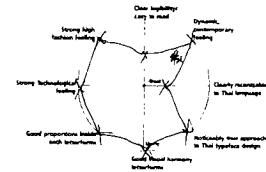
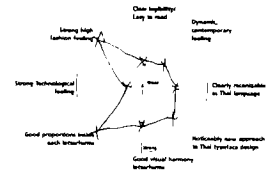


Name Felix W. Seifert  
Major \_\_\_\_\_ Age \_\_\_\_\_



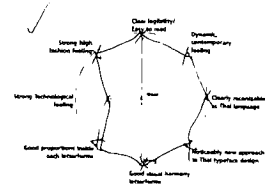
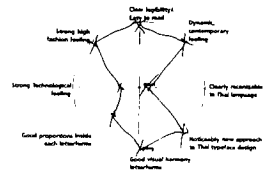
Other suggestion

Name Felix W. Seifert  
Major \_\_\_\_\_ Age \_\_\_\_\_



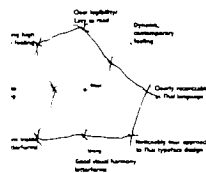
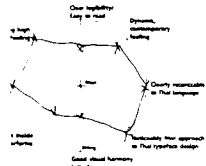
Other suggestion

Name Felix W. Seifert  
Major \_\_\_\_\_ Age \_\_\_\_\_



Other suggestion

0 evaluated



Name: Frederick  
Major: Bringing a Beam Age: 22



Other suggestion

Name: Frederick  
Major: Bringing a Beam Age: 22



Other suggestion

Name: Frederick  
Major: Bringing a Beam Age: 22

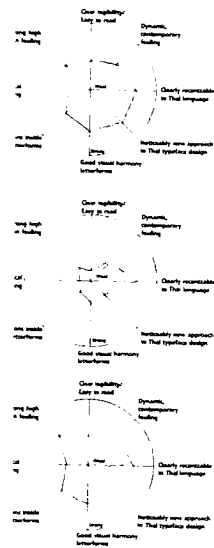


Other suggestion

Name: Frederick  
Major: Bringing a Beam Age: 22



Other suggestion



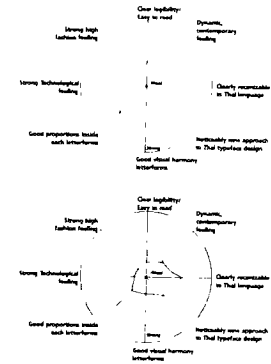
Name *Wichai*  
Major \_\_\_\_\_ Age \_\_\_\_\_

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Other suggestion \_\_\_\_\_



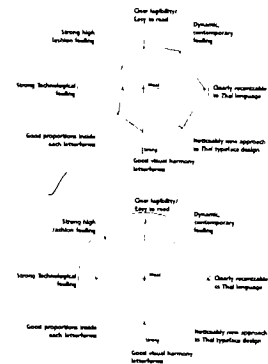
Name *Wichai*  
Major \_\_\_\_\_ Age \_\_\_\_\_

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Other suggestion \_\_\_\_\_

Name *Wichai*  
Major \_\_\_\_\_ Age \_\_\_\_\_



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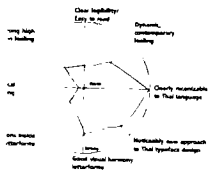
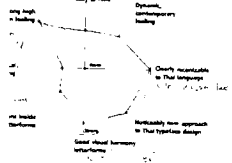
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Other suggestion \_\_\_\_\_

10 EVALUATE

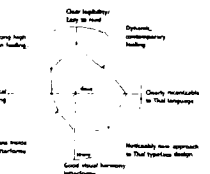
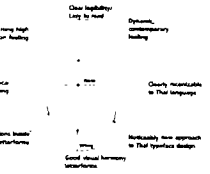
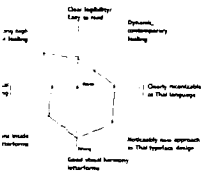


THIS IS THE WAY THE TYPE LOOKS



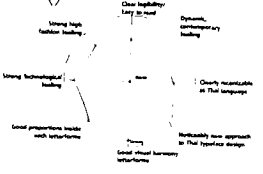
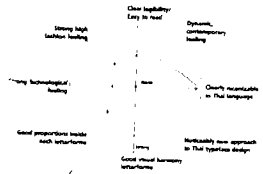
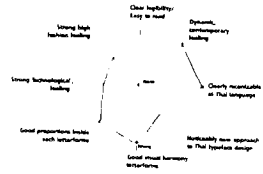
Other suggestion

Name: *Yusuf Kadir*  
Major: *Architecture* Age: *22*



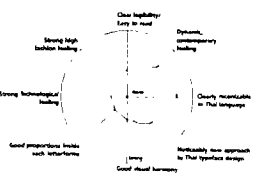
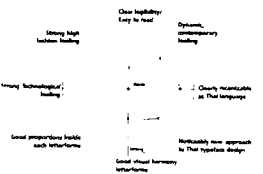
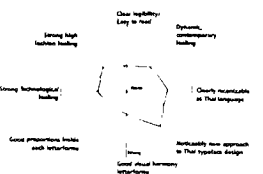
Other suggestion

Name: *Yusuf Kadir*  
Major: *Architecture* Age: *22*



Other suggestion

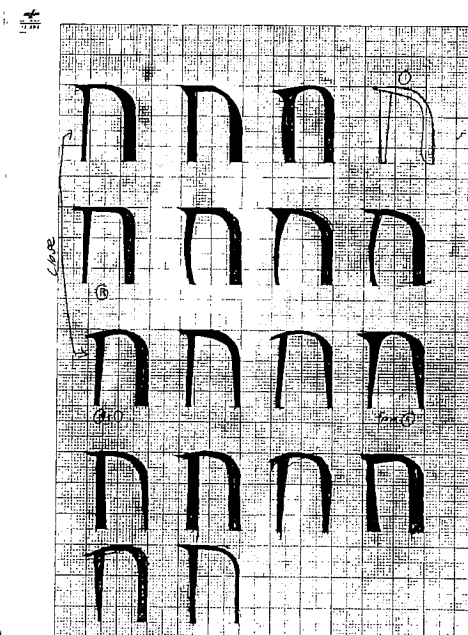
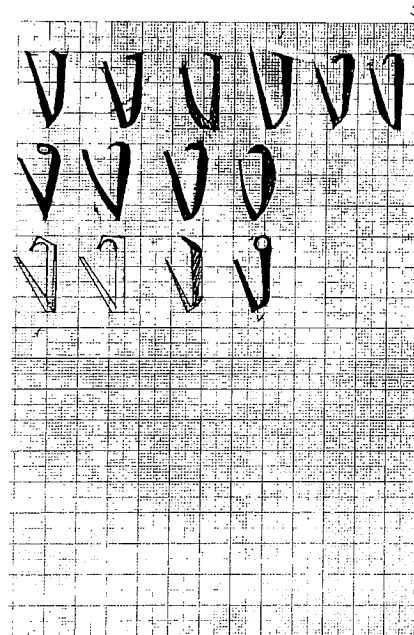
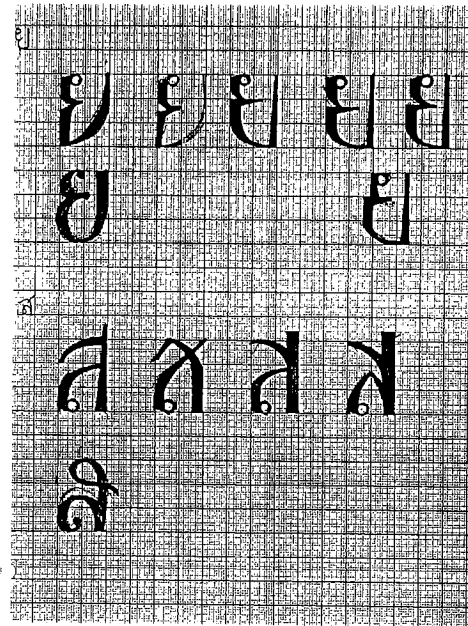
Name: *Yusuf Kadir*  
Major: *Architecture* Age: *22*



Other suggestion

*Appendices*

**C: Typeface Development**



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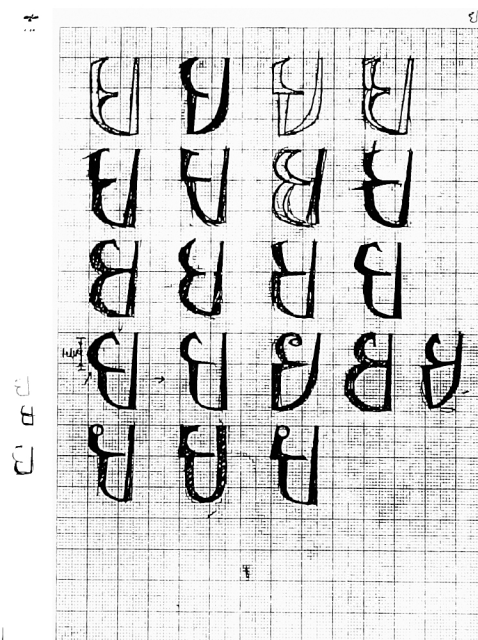
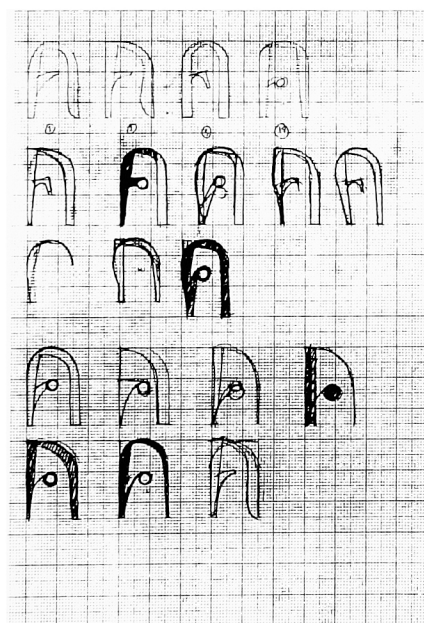
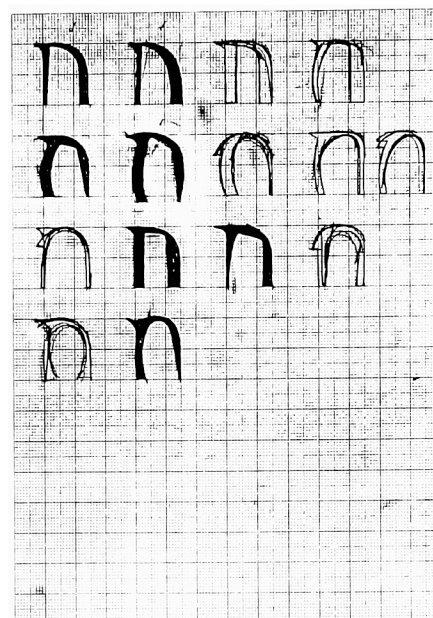
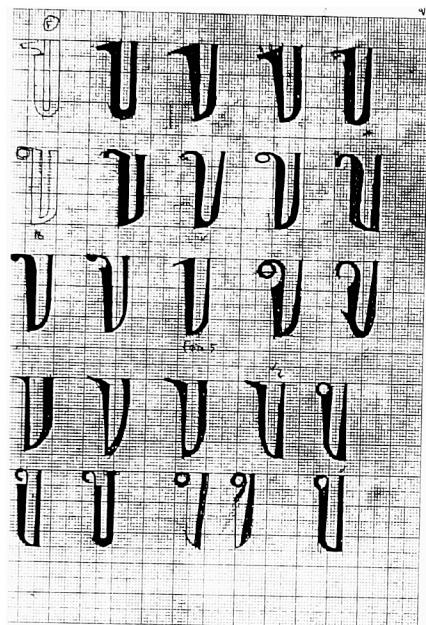
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*Appendices*

***D: Intermediate Evaluation***

Name Nicklas Kasper  
 Matrikel 123456789

Can you recognize the new typeface clearly and quickly as Thai language? Yes No  
if no, why?

Can you clearly recognise the differences between each letter? (yes) no  
If no, which letters are difficult to distinguish and why?

Does the new typeface have good visual harmony? (yes) no  
if no, why?

is each letter well proportioned? Yes No  
if no, which letters are problematic and why?

Are words clearly readable in this typeface? Yes No  
If no, why?

Does this new typeface feel dynamic and contemporary?  
if no, why?

is this typeface a noticeably new design approach? Yes ☒ No ☐

if no, why?

Does this new typeface have a strong high tech and high fashion feeling? ☒ Yes ☐ No  
If no, why?

Do you think the proportions between letters, consonants and vowels are correct when they are together in a word or sentence?

Yes No If no, why?

กทศคองจจ  
 ๗๗๗๗๗๗๗  
 จุจุจจจจจ  
 คคคคคคค  
 นนพพพพพ  
 ๗๗๗๗๗๗๗  
 ศศศศศศศ  
 ๗๗๗๗๗๗๗  
 ๗๗๗๗๗๗๗  
 ๗๗๗๗๗๗๗

ท้ายเรือรบแลดำใจให้ไปนอนกำของไม่จิมหัน?  
The war boat in all readiness and amply.  
เสียดเจ้ากัศคนำแต่ต้อง ไปนอนกำยุคลิน?  
Compassionate him, satisfied as perforce; long!  
พอนกร้าเองตบ-ไม่จำกัด  
พอนกร้าชาวไทย-ไม่พอ?  
Unhappy English too, Unlucky Thai too!  
เครื่องมือทำนบอกรณาไฟไทยปี๑๐๐๐  
The new tool for the new danger in 1900

### Industrial policy

recognize the new typeface clearly and quickly as Thai language? Yes No

Clearly recognize the differences between each letter? Yes No

Which letters are difficult to distinguish and why?

new typeface have good visual harmony? yes

are well proportioned? Yes No

Are letters are problematic and why?

Is clearly readable in this typeface? Yes No  
 72

2. new typeface feel dynamic and contemporary? Yes No

defeat = a noticeably new design approach? Yes No

3. New typeface have a strong high tech and high fashion feeling? Tm. No

think the proportions between letters, consonants and vowels are correct when they are together in a word or sentence  
 or if no, why?

וְהָיָה כִּי יִשְׁמַע  
 ה' אֶת הַקּוֹל  
 וְהָיָה כִּי יִשְׁמַע  
 ה' אֶת הַקּוֹל  
 וְהָיָה כִּי יִשְׁמַע  
 ה' אֶת הַקּוֹל  
 וְהָיָה כִּי יִשְׁמַע  
 ה' אֶת הַקּוֹל

ภายหลังจากรับแต่งตั้งให้ไปสอนที่โรงเรียนใหม่พบ?  
 The same teacher and students?  
 เสนอให้ยกเลิกการนำเครื่องใช้ไปสอนที่ลูกกับ?  
 Consistency makes difficult to present them?  
 ไปสอนที่ภาคยังถูกๆ - ไม่จำกัด?  
 ไปสอนที่ภาคไทย - ไม่พอ?  
 (Learner begins first - Learner's first time)  
 เครื่องมือใหม่จะยกมาฝึกไทยปี ๑๐๐๐

Name Wethharaporn  
Major \_\_\_\_\_

Can you recognize the new typeface clearly and quickly as The language? ☒ Yes ☐ No  
If no, why? \_\_\_\_\_

Can you clearly recognize the difference in between each letter? Yes (M)  
If no, which letters are difficult to distinguish and why?

Does this new typeface have good visual harmony? Yes No

to each letter well proportioned! yes No

if no, which letters are problematic, and why?

Are words clearly readable in this typeface? ☒ Yes ☐ No  
If no, why?

Does this new typeface feel dynamic and contemporary? Yes No  
if no, why?

Is this typeface a noticeably new design approach? (TM) No  
if no, why?

Does this new typeface have a strong high tech and high fashion feeling? ☒ Yes ☐ No  
If no, why?

Do you think the proportions between letters, consonants and vowels are correct when they are together in a word or sentence?  
 Yes No If no, why?

กขคคคคคคค  
 ฅณณณณณณ  
 คคคคคคคคค  
 บบปพพพพพ  
 ททททททท  
 ๕๕๕๕๕๕๕  
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ทยอยโอนแต่จำใจให้ไปสอนที่โรงเรียน?  
*He transferred, but he had to go to school?*  
 เคยเล่าที่คนมาแต่ต้องให้ไปสอนที่วัดกัน?  
*Someone's name, said he had to go to school?*  
 ฟอนที่ภาษาอังกฤษ-ไม่จำกัด  
 ฟอนที่ภาษาไทย-ไม่พอ?  
*Unlimited English lang. Limited Thai lang?*  
 เครื่องมือที่คนไทยเปิดไทยปี๑๐๐๐

Chotima Vongvithayatham

WTC SIDE WESTERN

Can you recognize the new typeface clearly and quickly in Thai language? ☒ Yes ☐ No

Do you clearly recognize the differences between each letter? Yes ☒ No ☐

Letters 16 and 17 are difficult to distinguish because they don't have the head

is letter well proportioned? ☒ Yes ☐ No

was clearly readable in this typeface? Yes No  
why?

Does New Typeface feel dynamic and contemporary? (yes) No  
why?

typeface is noticeably new design approach? (Yes) No

Let new typeface have a strong high tech and high fashion feeling? Yes ☒ No ☐

3) Are the proportions between letters, consonants and vowels correct when they are together in a word or sentence?  
No if (no, why?)

[illegible]

choosing Wangyibo's theme

Major	Age
-------	-----

Can you recognize the new typeface clearly and quickly as this language? (Yes) No

Can you clearly recognize the difference between each letter? YES NO

If no, which letters are difficult to distinguish and why?

Does the new spectacle have good visual harmony? ☒ yes ☐ no  
if no, why?

If no, which letters are problematic and why?

if no. 2077?

Does this new approach feel dynamic and contemporary? (Yes/No if no, why?)

if no, why?

Does this have appearance of a strong right turn and right turnoff coming? (yes) no  
if no, why?

Q. Yes or no, why?

[illegible]

คอมพิวเตอร์  
 นานกว่า  
 เปรียบเทียบ  
 กับไฟฟ้า  
 สมัยก่อน  
 ไซเบอร์สเปซ  
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 1000...  
 1000...

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[illegible][illegible]

[illegible][illegible][illegible][illegible]



[illegible][illegible][illegible]





Name \_\_\_\_\_ Age \_\_\_\_\_

Can you recognize the new typface clearly and quickly in this language? ☒ Yes ☐ No  
If no, why? \_\_\_\_\_

Can you clearly recognize the difference between each letter? ☒ Yes ☐ No  
If no, which letters are difficult to distinguish and why? \_\_\_\_\_

Does this new typface have good visual harmony? ☒ Yes ☐ No  
If no, why? \_\_\_\_\_

Is much letter used proportionally? ☒ Yes ☐ No  
If no, which letters are proportional and why? \_\_\_\_\_

Are words clearly readable in this typface? ☒ Yes ☐ No  
If no, why? \_\_\_\_\_

Does this new typface feel dynamic and contemporary? ☒ Yes ☐ No  
If no, why? \_\_\_\_\_

Is this typface a noticeably new design approach? ☒ Yes ☐ No  
If no, why? \_\_\_\_\_

Does this new typface have a strong high tech and high fashion feeling? ☒ Yes ☐ No  
If no, why? \_\_\_\_\_

Do you think the proportions between letters, consonants and vowels are correct when they are together in a word or sentence?  
Yes ☐ No ☒ If no, why? \_\_\_\_\_

[illegible]

1001  
 Süßpfeifen Pflanzholz  
 Manufacturing Engineering  
 Age 25 25  
 as you recognize the new typeface clearly and quickly in that language? (Yes) No  
 /no, why?  
 as you clearly recognize the differences between each letter? Yes (No)  
 /no, which letters are difficult to distinguish and why?  
 yes the new typeface have good short harmony? (No) No  
 /no, why?  
 is each letter well proportioned? (No) No  
 /no, which letters are problematic and why?  
 it sounds clearly readable in the typeface? (Yes) No  
 /no, why?  
 does the new typeface feel dynamic and contemporary? (Yes) No  
 /no, why?  
 is the typeface a noticeably new design approach? (No) No  
 /no, why?  
 does the new typeface have a strong high tech and high fashion feeling? Yes (No)  
 /no, why? I don't know  
 so you think the proportions between letters, consonants and vowels are correct when they are together in a word or sentence?  
 /no, why?

[illegible]

Major \_\_\_\_\_

Can you recognize the new typeface clearly and quickly in this language? (Yes) No

If no, why? \_\_\_\_\_

Can you clearly recognize the difference between each letter? (Yes) No

If no, which letters are difficult to distinguish and why? \_\_\_\_\_

Does this new typeface have good small harmony? (Yes) No

If no, why? \_\_\_\_\_

Is each letter well proportioned? (Yes) No

If no, which letters are problematic and why? \_\_\_\_\_

Are words clearly readable in this typeface? (Yes) No

If no, why? \_\_\_\_\_

Does this new typeface feel dynamic and contemporary? (Yes) No

If no, why? \_\_\_\_\_

Is this typeface a noticeably new design approach? (Yes) No

If no, why? \_\_\_\_\_

Does this new typeface have a strong high tech and high human feeling? (Yes) No

If no, why? \_\_\_\_\_

If you think the proportions between letters, characters and words are correct when they are together in a word or sentence

(Yes) No

ทบทวนจงใจ  
ทำคุณคุณ  
จุฑามณ  
ดิดดิด  
บปพพพพ  
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คัสสสส  
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11 : ๑ ..  
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Major: Psych

Age: \_\_\_\_\_

Can you recognize the new typexats clearly and quickly as this language? Yes No

Yes, why?

Can you clearly recognize the differences between each letter? Yes No

Yes, which letters are difficult to distinguish and why?

g, c, o, n, t

Does the new typexats have good visual harmony? Yes No

Yes, why?

Is each letter well pronounced? Yes No

Yes, which letters are problematic and why?

g, c, o, n, t

Are words clearly readable in this typexat? Yes No

Yes, why?

Does this new typexats feel dynamic and contemporary? Yes No

Yes, why?

Is this typexat a noticeably new design approach? Yes No

Yes, why? Some letters look like old design

Does this new typexat have a strong high-tech and high-future feeling? Yes No

Yes, why? I don't think so

Do you think the proportions between letters, consonants and vowels are correct when they are together in a word or sentence?

Yes, I think so

[illegible]

[illegible][illegible][illegible][illegible]





[illegible][illegible][illegible][illegible]

[illegible][illegible]

ทททขอเชิญ  
ชมงานมหกรรม  
นิทรรศการ  
ศิลปวัฒนธรรม  
และอาหาร  
ไทย  
ที่  
สวนสาธารณะ  
เฉลิมพระเกียรติ  
สมเด็จพระนางเจ้า  
สิริกิติ์ พระบรมราชินีนาถ  
อ.เมือง จ.ภูเก็ต  
วันที่ ๑๕-๑๗  
พฤษภาคม ๒๕๖๕  
เวลา ๑๐.๐๐-๑๘.๐๐ น.

[illegible]

กากขี้เถ้าผสมผงซักฟอก  
พ่นบนผนังทุกห้อง  
ลดกลิ่นคาวและดูดซับ  
ไขมันจากผนังครัว  
สีก่อนออก  
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๐๙๐๕๕๕๕๖๕๕

[illegible][illegible][illegible]

[illegible][illegible]

ordinary pronunciation. I want to \_\_\_\_\_  
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[illegible]



[illegible]

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๑๒ = 7  
๑๒๔๕๖๗๘๙

ภาพตัวประกอบที่ใช้ในธนบัตรของไทยมีอะไรบ้าง?  
แสดงว่าภาพที่นำมาใช้เพื่อเป็นเกียรติกับ?

ธนบัตรที่เก่าแก่ที่สุดของประเทศไทย - มีค่าเท่าใด?  
ธนบัตรที่มีลักษณะ - เป็นอย่างไร?

(Source: Banknotes & Coins, The Thai Bank)

ทำจนจบมีเวลาประมาณกี่วินาที? ๓๐๐๐

The end test for this graphic design 2020

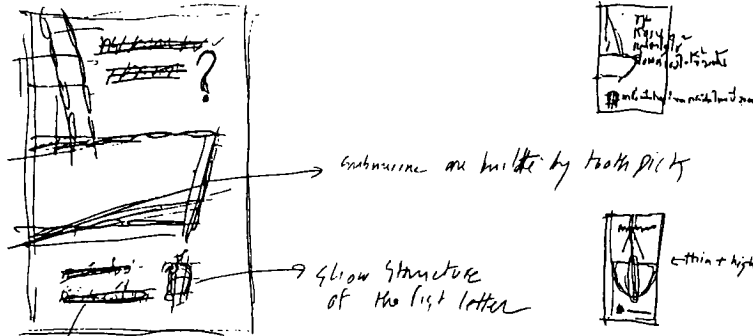
[illegible][illegible]

[illegible][illegible][illegible][illegible]

*Appendices*

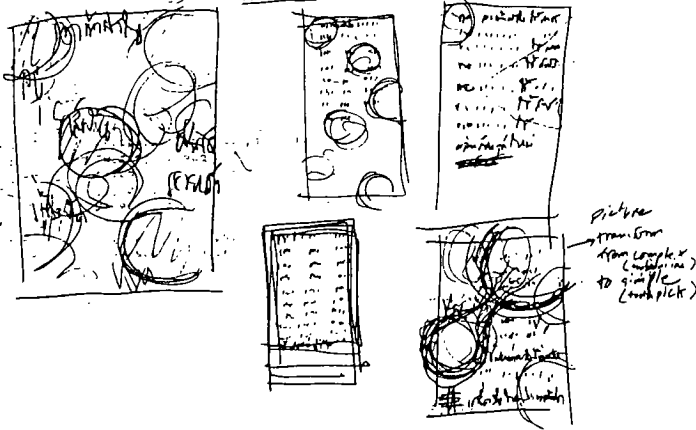
***E: Poster Sketches and Development***

sell, very minimalist - but very clear and simple - simple



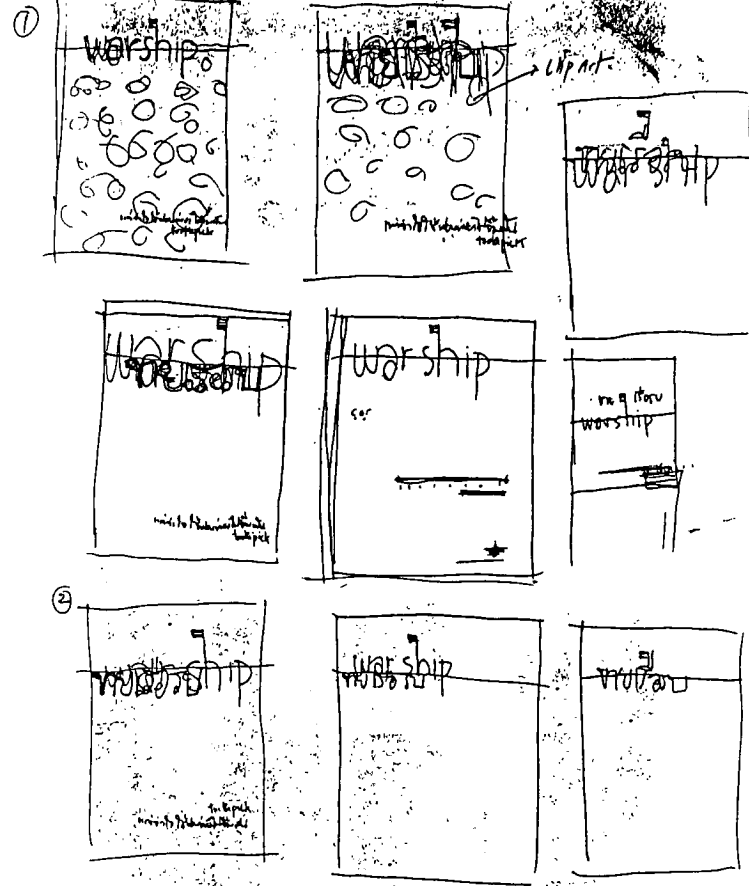
the new look of the this graphic of gear...

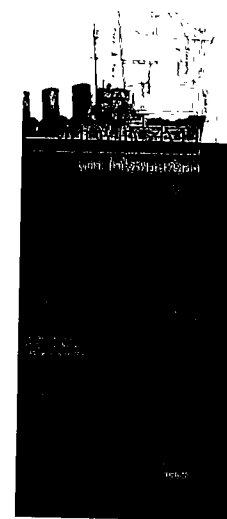
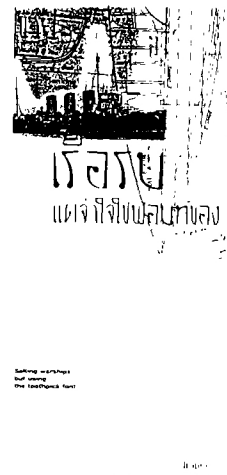
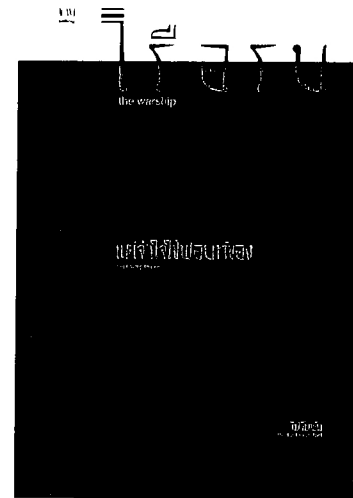
The meaning

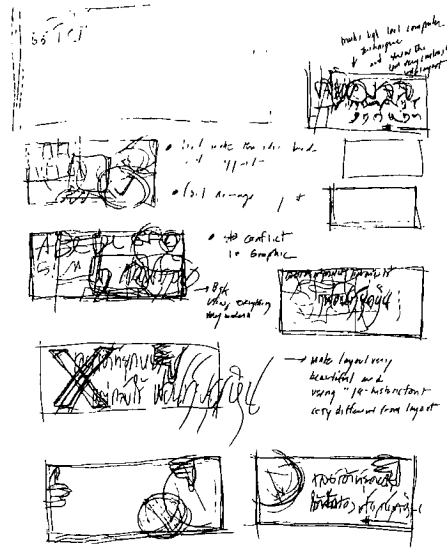


Selling

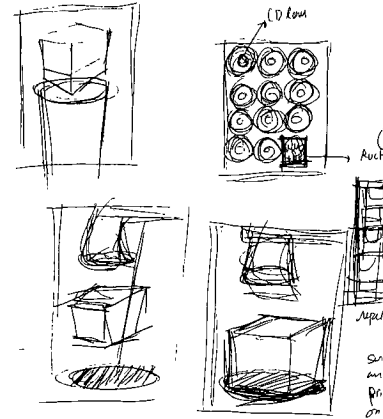
Graphic + bright color



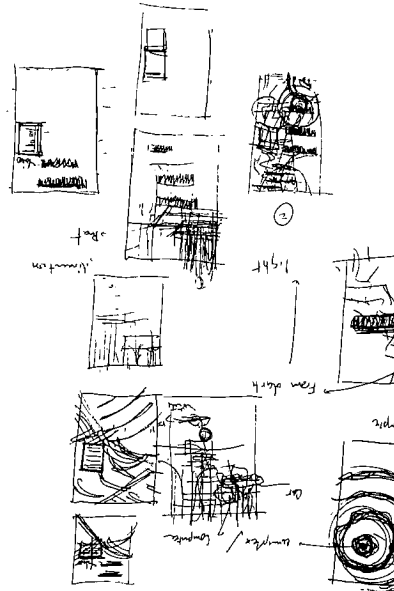
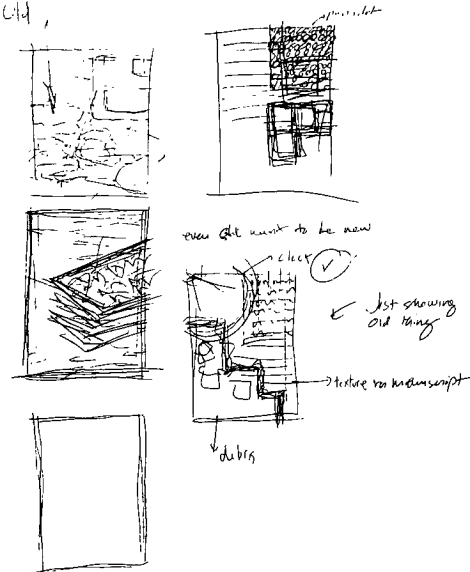


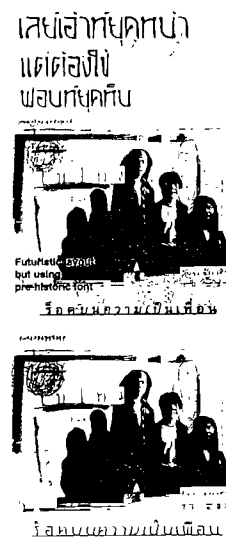
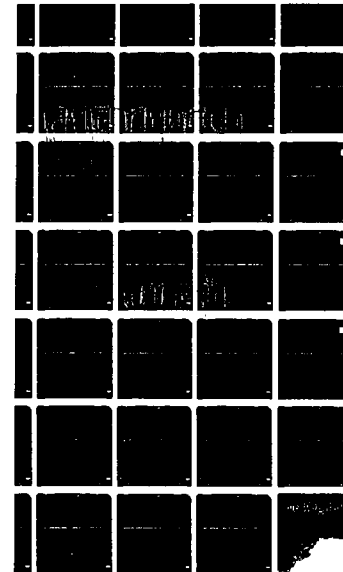
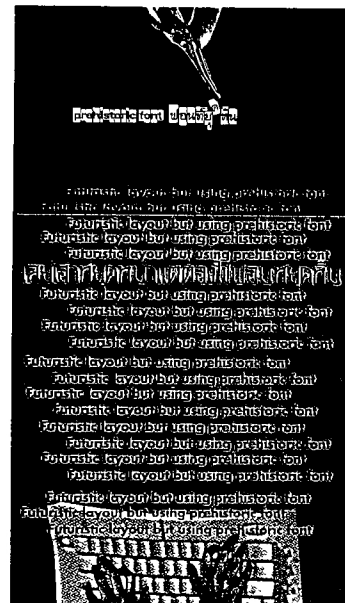


old conflict



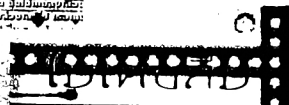
old





# เสียงเจ้าทศตภา แต่ต้องไป เปลี่ยนกับ

เสียงเจ้าทศตภา  
แต่ต้องไป  
เปลี่ยนกับ



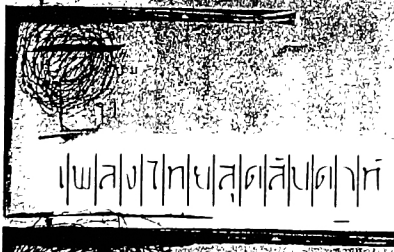
เสียงเจ้าทศตภา  
แต่ต้องไป  
เปลี่ยนกับ

เสียงเจ้าทศตภา

Interpreting Layouts  
represented in  
pre-historic fonts

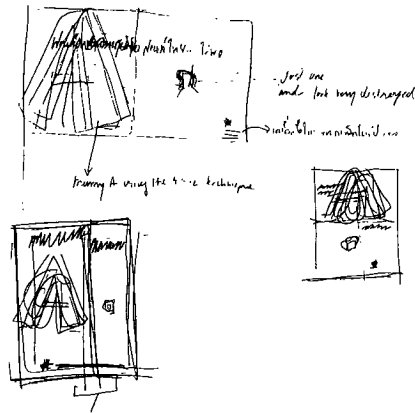
Futuristic Layout  
But having to use  
pre-historic font

เสียงเจ้าทศตภา

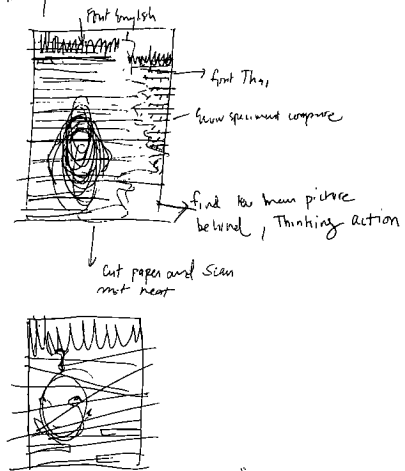




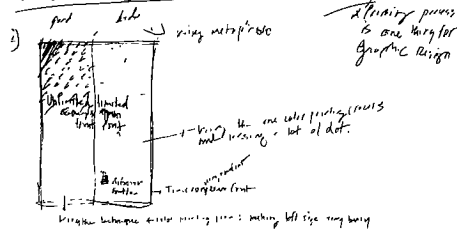
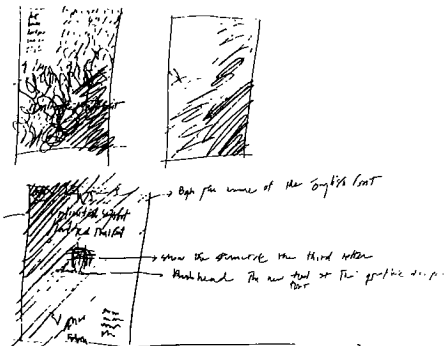
mixed



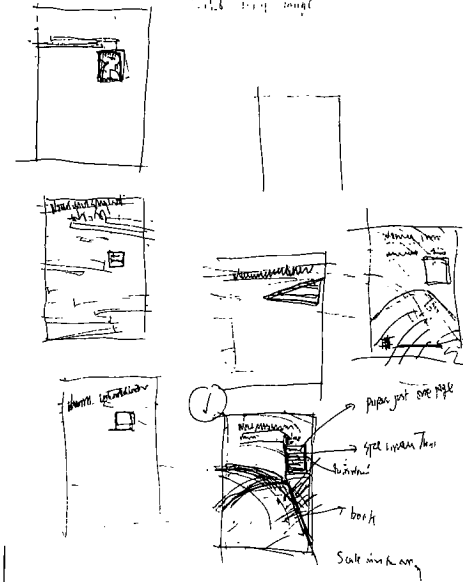
many choice



1. mixed 1st



1. mixed 1st



ฟอนต์ภาษาอังกฤษไม่จำกัด


ฟอนต์ภาษาไทย ไม่แพ้

ฟอนต์ภาษาไทย ไม่แพ้

$$r = \sqrt{r_1^2 + r_2^2} = 5.1 \quad (3.46)$$

ฟลอบทภาษาจีนโบราณ

ฟลอบทภาษาไทยโบราณ



อ

น

ศูนย์วิจัยภาษาและภาษาเขียน

Not

**ស្ថាប័ន: វិទ្យាស្ថាន ប៉េងហៃ ឆ្នាំ២០០០**

ฟอนท์ภาษาอังกฤษไม่จำกัด

ฟอนท์ภาษาไทย...ไม่พอ

Frutiger

Per

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esplate

Copperplate

Modoni

ca

๓๕ ปีในวงการ พิมพ์ดีดไทย

THAI TYPE CO., LTD.

laco-  
time

100

**ศูนย์วิจัยและพัฒนาการเพาะเลี้ยงสัตว์น้ำจืด**

