The Typography of Indus Seals

Devajyoti Sarkar

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Author Note

Devajyoti Sarkar: https://orcid.org/0009-0007-3432-2082, @dsarkar@universeodon.com

Correspondence concerning this article should be addressed to Devajyoti Sarkar. Email:

customercare@vamra-vaikhanasa.com

Abstract

Although most discussions treat the Indus seals as inscriptions, they are not dissimilar to printing presses and their inscriptions can be characterized as typefaces. They have a degree of standardization and sophistication that makes them comparable to modern fonts. While designing the Ida font for the Indus script, I had the opportunity to study this typography in detail and this paper attempts to compare it to our modern one. Unlike our evolution from Gutenberg's Blackletter to Serifs and finally to the Sans Serifs in the past century, the Indus seals standardized on "sans serif" typefaces right at the start. A full repertoire of techniques we use today to make typography clean and elegant was already in use by the Indus artisans more than 4,000 years ago. The history of Typography stretches right back to the beginning of human civilization and the Indus civilization was an important part of that story.

Keywords: typography, indus script, indus seals, ida font, sans serif typefaces

The Typography of Indus Seals

Writing stands second only to language itself as one of the greatest inventions of human history. It enables communication and collaboration over distance and time. It is the basis of civilization itself and its ability to organize. It is what makes history possible.

In the Indus Script we see one of the earliest forms of writing. We find inscribed seals in both Mesopotamia and the Indus from roughly 3500BC. In the Indus, we find steatite seals like the one in Figure 1 used in large scale during the Mature Harappan period (2600-1900BC). Across the length and breadth of a region the size of Western Europe, and for close to a thousand years, the script emerges fully formed and remains standardized with little change.

Figure 1

A Unicorn Seal

(Courtesy The Met Museum)

Indus seals also represent one of the earliest forms of printing. A seal was used to stamp its contents on a medium much as Gutenberg's printing press would 4,000 years later. In the process of creating the **ida font** (Sarkar, 2023), a commercial-grade open source font for the Indus script, it became clear that these inscriptions are more accurately described as typefaces. Their typography is

comparable to modern sans-serif fonts. Their emphasis on minimal and elegant design is something that we are only recently beginning to standardize upon as we create responsive interfaces for tablet and mobile devices.

A Brief Background

Gutenberg's real innovation was in the creation of movable type, where the same printing plate and letters, could be reused across multiple different pages and books. This allowed for mass production of books and forever changed the economics of publishing. In 1450 Gutenberg printed the first Bible and a scant 50 years later there were more than a 1,000 printing presses and as many as 8 million books printed (*Global spread of the printing press*, 2023).

But from a typography standpoint (Tuts+, 2022), Gutenberg's Bible was printed in an old Blackletter typeface like the one in Figure 2(a). This was similar to the Calligraphic styles that monks used in hand-written manuscripts. In the 15th and 16th centuries, Roman typestyles became popular because Blackletter was difficult to read. These were inspired by Roman monumental inscriptions that featured serifs and diagonal stress, i.e. the axis of the letters was tilted as shown in Figure 2(b). Serifs helped make text more legible by guiding the eye down a stroke. In the 1900s we find the adoption of Sans Serif fonts which had a vertical stress and the absence of serifs. They led to clean and minimal typefaces that were easy to read. In the modern digital era, Sans Serif typefaces are often the recommended choice because of their legibility even in constrained form factors.

Figure 2

Samples of typography

(a)   (b)   (c)
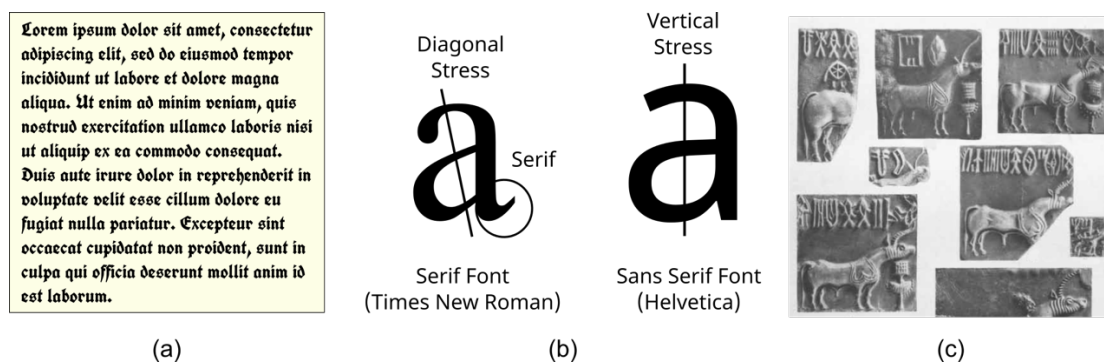
From a Typography standpoint, as we can see in the sample typefaces in Figure 2(c) (Marshall, 1931), the Indus seals are much closer to modern fonts than the ones Gutenberg used. They are characterized by simple and straight forms with the overwhelming majority having a vertical stress. They were typically "Sans Serif" in design. Given the severely constrained form factor of a seal, often no more than 3 to 5 cm in breadth, this minimal design was the natural choice. Our modern typography was something that the Indus Civilization adopted right from the start, most probably for the same reasons.

The longest inscription discovered till date is no more than a couple of dozen characters long so we have no idea what kind of typography they used in long form copy. It is possible that they were more calligraphic in nature than a seal and could have employed completely different styles.

Indus Typography and the design of the Ida Font

The seals were hand-carved so did not need to concern themselves with sizes and typesetting, with fonts and reusability. But they were not free-form calligraphy either. They achieved a remarkable level of standardization, and were more akin to PostScript fonts than bitmapped ones, in that they were defined by relative proportion rather than "pixels", more by "math" than by "data". This was clearly evident while creating the SVG representations of Indus characters for the **ida** otf font, their standardized forms "just fit" into their respective em-blocks and with one another; with minimal effort they became typeface that was both modern and natural.

The design behind the **ida** font is something I call ***"Gol-Gol Mota-Mota"*** which in Bengali means "round round, fat fat". It aims to make the Indus script accessible and fun. It consciously tries not to take itself too seriously. Unlike the sleek and elegant typefaces of the actual seals, it aspires to give the text a more casual, child-like joy. As an example, the last two lines of Figure 3(a), the typeface ranges from rounded to straight and flat, and, in the first line, back again. I suspect something like that would have made an Indus seal designer blanch; although one hopes it would have brought a smile to their face.

Figure 3

Ida Samples

(a)

(b)
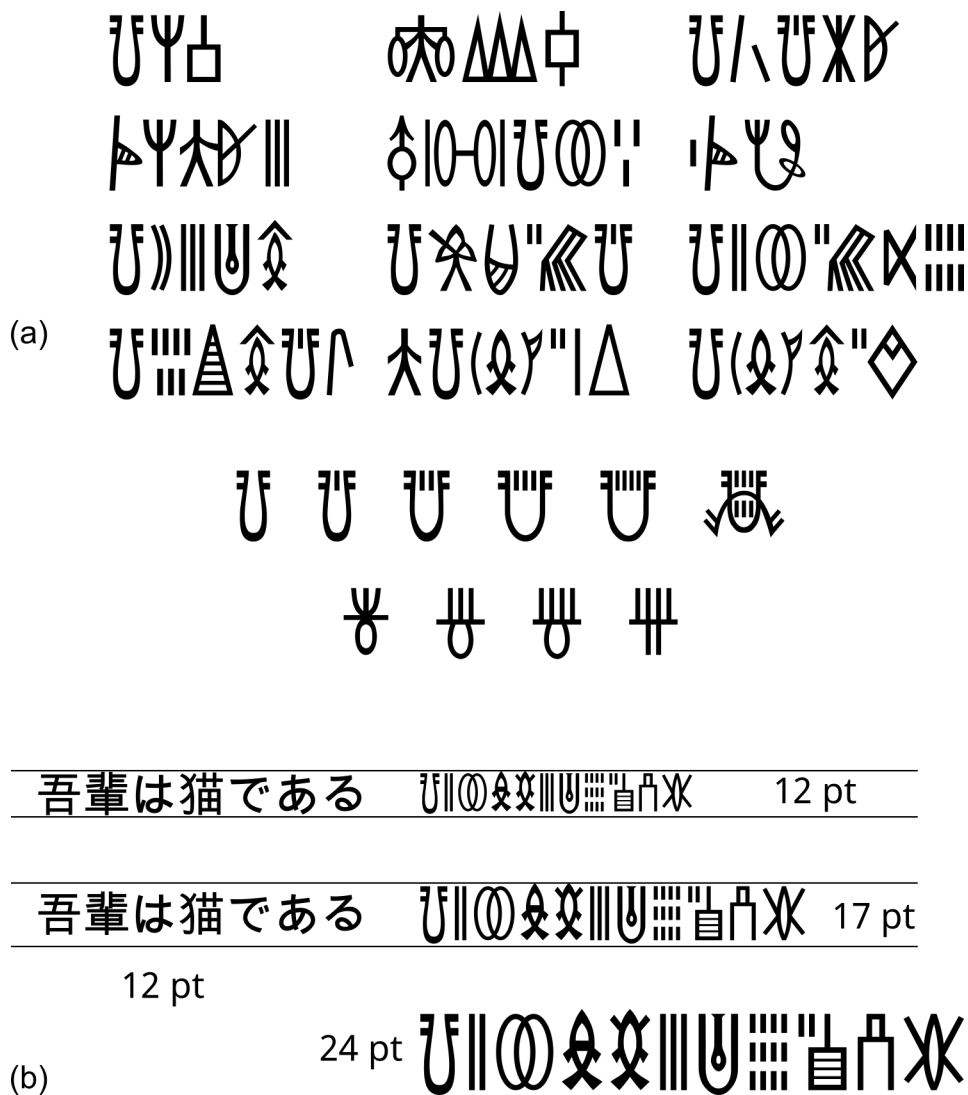
The **ida** font spent considerable attention on making Indus text legible on a computer

screen. There are about 640 Indus characters in the font currently. This means it is more complex

than any Latin or Western typeface but simpler than the Han characters in most CJKV fonts. If we

compare ida, side by side, with a Kanji font in Figure 3(b), we see that the Kanji characters fully

utilize a square em-size with far more emphasis on strokes. The Indus glyphs (perhaps indicative of

their use in seals) are tall and about half-width. This means at the same point size, the Kanji

character is more legible because it utilizes twice the area. At the same width or twice the point size,

the Indus character has roughly twice the area and seems much cleaner. So for a like-for-like comparison we need a point size 1.4142 times larger than the corresponding Kanji characters. We compare 12pt Kanji with 17pt Indus characters and the two fonts are reasonably comparable. But the maturity of the modern CJKV fonts is evident in their emphasis on strokes that allows for better legibility even in smaller sizes.

The Indus characters seemed to lose legibility as they become smaller. In order to compensate for this loss **ida** chose to give more "weight" to its forms and make them more rounded. This is a design choice that the seals themselves do not make. As one can see in Figure 2(c), even in their small size the seals are clearly legible.

Correcting for the human eye

Figure 4

Correcting for Limitations of the human eye
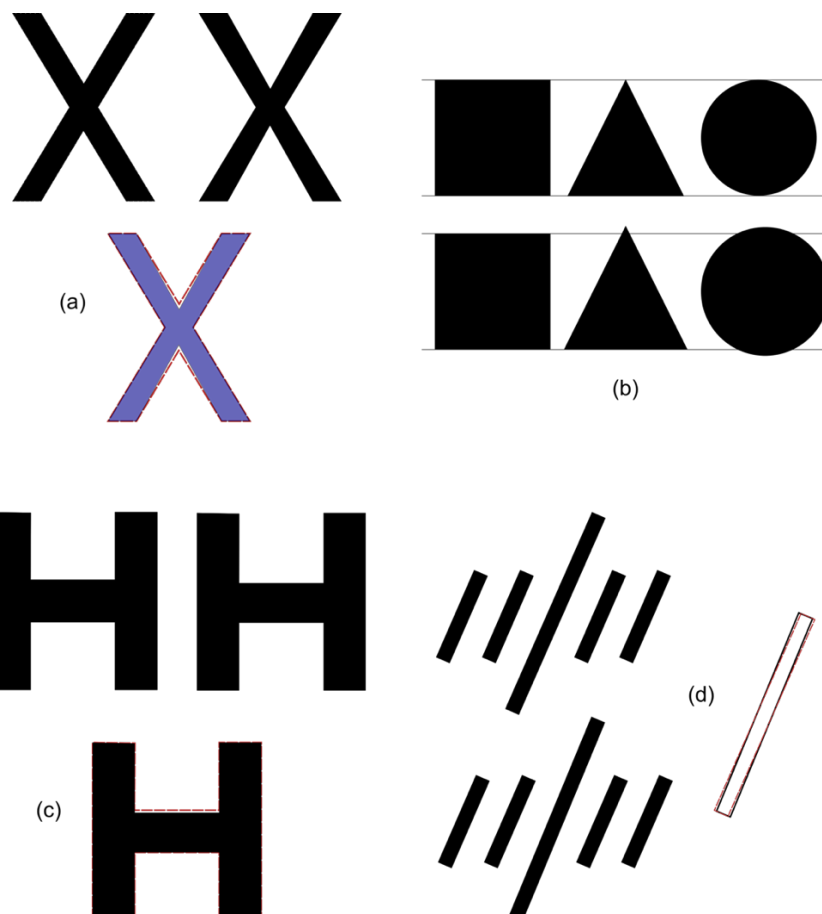
A modern typeface corrects for a number of optical defects (Willis et al., 2022) that the human eye is subject to. As an example, in Figure 4(c) horizontal lines need to be slimmer to appear the same as vertical lines. The H to the left has the same thickness for both but to the eye the horizontal line appears to be thicker than the vertical one. The one on the right shrinks the thickness by about 6% for both to appear about the same. The difference can be seen in the H in top bottom.

Similarly in Figure 4(d), longer lines need to slant less than shorter ones to appear the same angle. The set of lines on the bottom corrects for this and appears more natural. The difference is about a few degrees. In Figure 4(a), we can see that two crossing lines will need to be drawn out of alignment in order for it to appear aligned to the eye. Another principle commonly used in shaping modern fonts is that the shape of a glyph will contribute to how high it needs to be. In Figure 4(b), we see that. The point of the triangle and two curved edges of the circle need to extend further than the flat edges to appear the same.

Figure 5

Indus Typography correcting for the human eye.

(a)

(b)

(c)

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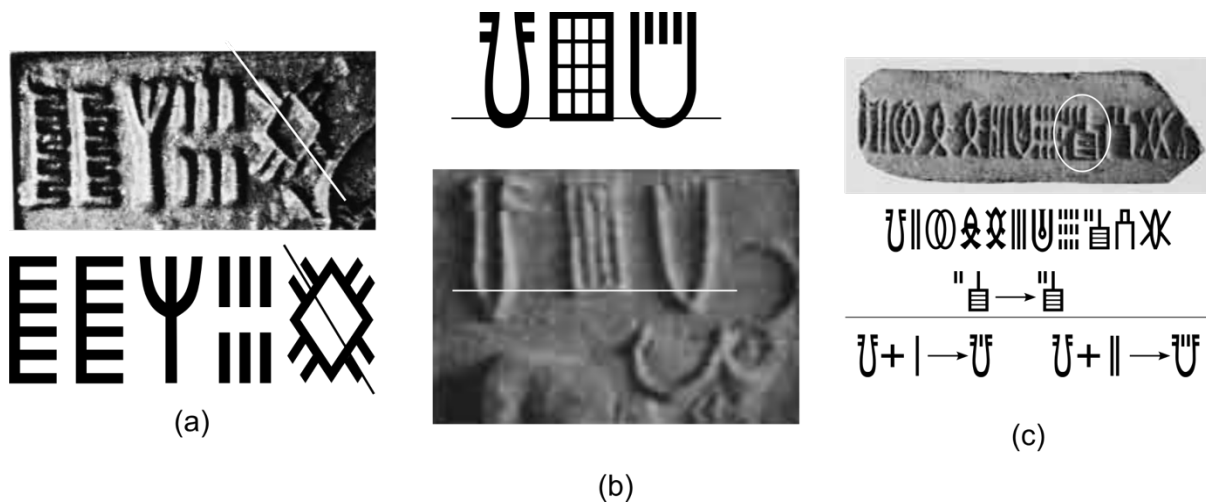
We find similar techniques being used in Indus seals. For example, in Figure 5(a) (Shah, 1991), we see the same treatment of the difference in slants of shorter versus longer lines that we saw in Figure 4(d). In this case to guide the unaided eye, even when the line is absent, it needs to slant differently than the shorter ones. Also, in Figure 5(a), the horizontal lines are drawn thinner

than vertical ones. Like Figure 4(c), we find that both the font and the seal itself corrects for this issue. In Figure 5(b), we see that rounded glyphs extend further than flat glyphs to give the impression that they are of the same height. This is found both in the font as well as in the seals. There are several other techniques used to create a modern font and we see them in use by Indus seal makers.

We find kerning applied consistently across all of the Indus seals. The two characters in Figure 5(c) need to "overlap" in order to give a natural look. This is implemented in modern typography using Pairwise Kerning tables. The **ida** font had to create more than a hundred of such pairwise kerned characters as well as adjust left and right bearings for every character to enable a proportional appearance that is present in every Indus seal.

In the Indus script we find glyphs that combine to give a new character form almost like a "ligature". Unlike actual ligatures that are quite common in later Indic scripts, this is more like the phono-semantic compounds that give rise to over 90% of the glyphs in the Chinese script. The resulting compound is a separate character. Although technically not a ligature in the Unicode sense, it does involve combining two glyphs into one.

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Summary

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In attempting to create the **ida font** for the Indus script, I got the chance to take an in-depth look at the sophisticated and beautiful typography with which they were carved so many thousands of years ago. This is an area that has not received much attention so far. I hope this section can help contribute to an appreciation of the depth of Indus expertise in this field. It may be safe to say that Typography has a rich and storied past that goes back to the beginning of civilization itself. The Indus seals were an important part of that story.

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