Roots of reuse

Johann Gutenberg was a tinker. An entrepreneur who borrowed heavily in pursuit of an invention that he thought would make him a fortune. A largely unsuccessful businessman who lost his books and tools when creditors foreclosed. An obscure goldsmith who, sometime between 1452 and 1455, published an edition of the Bible that would change the world.

That is virtually all we know of the man who invented moveable type. Because so little is known about Gutenberg, it is easier to see his invention as born of the time than of the man. For the development of printing in the 15th century is inextricably linked to the period known as the Renaissance.

The technology gap. If only a handful of people could - or cared to - read a book, it made sense to produce them by hand, as had been done for centuries. Working from an original, the exemplar, each book was a hand-printed reproduction of the original.

The scribes had evolved a division of labor to speed up manuscript copying. Tradesmen prepared skins, pens, and inks. Woodcuts were used to reproduce pictures cheaper and faster. Rubricators cut the intricate capital letters. Eventually, even the text was separated into single letters and stamped separately.

Block-printing technology was also being advanced, in part by the popularity of card games that created a demand for better quality playing cards. The craft of papermaking was well-established in Europe by the middle of the 15th century. Even metal casting, as practiced by the apprentice goldsmith Gutenberg, was a familiar process.

So the elements were in place to be exploited: book publishing already had division of labor, printing by impression was known, and metal casts had been produced. Gutenberg's idea was simple enough: Replace the scribes and steal their customers. He probably began tinkering with casting metal type sometime in the 1440s, but the institutions that possessed exemplars were jealous of their originals and their monopoly on the market. Independent printing ventures were discouraged by law and policy, so his experiments - and those of many others - were done in secret.

The invention. Eventually, however, the spread of education from the clergy to the privileged laity and then to the general populace created a demand for printed material that the monks in the scriptoria could neither meet nor discourage.

Gutenberg's invention spanned the gap. He supplied the vision to draw all the available technology together at the right time, when the demand for more, better, cheaper books was growing. He used his craftsmanship to cast accurate types that were easy to assemble and he invented a method to distribute the types after printing so they could be reassembled in another order.

He wasn't the only one to see the need, and he wasn't the only one with the skills necessary to pull them together. But his genius lies in the fact that he did it first and well — the basic technique he developed to cast the type did not change for several centuries.

This is not to diminish the importance of Gutenberg's role in history. As Douglas McMurtrie wrote in The Book, "It does not at all minimize the importance of the invention of printing or the genius of the inventor to point out that the invention was the result of a process of synthesis or combination of known elements. For that power of the human mind which can visualize known and familiar facts in new relations, and their application to new uses - the creative power of synthesis - is one of the highest and most exceptional of mental faculties."

"Others had seen the need which Gutenberg saw, and others had experimented with printing and had at their disposal all the elements essential to success. But with every condition favorable toward the middle of the fifteenth century, the invention of printing still awaited the patient labor of a man with a truly creative mind."