The Geography of the Printing Revolution

Visualizing the Spread of Print in the Context of Historical Trade, Markets, and Conflicts: 1450 - 1500

INTRODUCTION

he history of printing is long and rich, stretching back to the development of woodblock printing in ancient China and Korea, the first recorded use of movable type in India, and the prolific manuscript production of Medieval European monasteries. To visualize such a history requires more data than what was available in this project. On one hand, an ideal visualization stretches beyond the political and ecclesiastical borders of Roman Catholic Western Europe into historical Ottoman, Indian, and Chinese territories; on the other hand, it zooms into a city – consider cosmopolitan cities such as Venice, Rome, or Paris – to dissect social, political, and economic factors on a fine scale.

Weighted Suitability Analysis

Based on: 40% major trade routes, 20% historical conflicts, 15% fairs, 15% bishoprics, 15% universities.

Low Suitability





BRIEF HISTORY

Before the printing press, the medieval book trade was driven by monasteries' manuscript production, which was a tedious and often unreliable process. With the first recorded use of his printing press in 1454, Johannes Gutenberg introduced the possibility of a semi-automated workflow, more efficient and precise than manuscript production, to the early book trade. These early (i.e. before 1501) printed books, which mimic the intricate visual structure of a handwritten manuscript, are also known as Incunabula.

If Gutenberg was the entrepreneur, the printing business was quickly dominated by the visionaries: scholars and merchants who quickly established their own printing shops in the wake of Gutenberg's fame. Despite the growing market, not every printing press created in the following years showed commercial success, and the printing business soon became concentrated in a few major urban centers.

This analysis attempts to visualize the success of some printing presses over others, taking into account a combination of geographic, economic, and social factors.



METHODS

Much of the data for this project comes from University of Iowa's The Atlas of Early Printing. This data can be viewed with proportional symbology in the Total Output map. I calculated output per decade on Microsoft Excel to show the spread of printing over time. Geospatial data for Bishoprics and Ecclesiastical Provinces comes from Harvard University's Mapping Past Societies project.

For the suitability analysis, I used the kernel density, distance accumulation, and reclassification tools (a value of 7 being the most suitable) to create raster layers. For the weighted analysis, I used the raster calculator tool.

RESULTS

The suitability analysis shows that the major printing centers arose primarily in areas of moderately-high to high suitability. Notably, however, some "highly suitable" areas, like Southern France, showed few or no productive presses.

LIMITATIONS

This data does not show certain historical contexts that were also important factors for the spread of print (e.g. typography). The data was compiled from primary and secondary historical sources, and thus is incomplete or limited in some areas (refer to Spatial Analysis Factors).

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		and a second	Strasbourg	35
Biggest Printers: 1450—1500			Venice	26
Place	Total			
Venice	3651		- Part	Zat
Paris	2939			A
Rome	1851			2.35 2.35
Cologne	1623		-	A.
Lyons	1308			And a
250 Distribution of	Print Output	-		A A
100		-Median : 6	48 _	- 4
50		-	Place	To



Comparing historical data with a suitability analysis shows that the greatest producers of print in the late 15th century thrived in areas that were near major trading crossroads, far from conflict, and near early book markets. Importantly, this analysis does not capture all the historical contexts behind the spread of early print, nor does it account for the instability of an early printed book market as shown in Observed Data. It does, however,

print: a vital ingredient for the Renaissance, Protestant Reformation, Scientific Revolution, and further developments in European History.

Universities

roximity to Universities





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Lyons

begin to set the stage for the future of Note that Paris overtakes Venice with a significant increase in production from 1491-1500. Political and economic instability in Italy in the late 1490s disrupted the Venetian printing trade. This, as well as the appearance and disappearance of many unsuccessful presses, represents the instability of the early printing trade.

SPATIAL ANALYSIS FACTORS



Like any manufactured commodity in the medieval world, access to these routes and proximity to major trade crossroads would have been ideal for a printing business to access both markets and resources in the earliest years of printing. I used distance accumulation from 7 (immediate proximity) to 1 (more than 10



Conflict (i.e. historical land battles) drove scholars and merchants out of afflicted cities. Consider Mainz, the birthplace of the printing press, which experienced a fairly significant drop in printing activity after the 1462 Sack of Mainz. This dataset included neither the Italian Wars of the 1490s, nor the historical impacts of the



Fairs here represent the individual market. I calculated density, rather than proximity, from 7 (high density) to 1 (low density) to represent areas with a large individual market.

Lyons is a particularly interesting case study, as its early success can be attributed more to its proximity to a collection

of fairs instead of a trade crossroad.

Universities here represent one part of the institutional market, which was vital to the success of early printing presses. The institutional market (universities, the Church, and government centers) was more stable than the individual market in the early print trade. I calculated distance accumulation from 7 (immediate proximi-

Bishoprics



Bishoprics acted as administrative centers for the Roman Catholic Church, the other institutional market measured in this analysis. Density was calculated from 7 (high density) to I (low density) to show the presence of the Church rather than proximity to a bishopric. Realistically, books would have been bought by and

days' journey). I used 50 km as a rough approximate for a day's journey on horse.

1453 Fall of Constantinople. Distance accumulation was used, from 7 (far from

conflict) to 1 (immediate proximity).

ty) to I (more than I0 days' journey).

stored in monasteries (not directly in

bishoprics), but the availability of monas-

tery data for this purpose was limited.

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May 2025 | Introduction to Geospatial Humanities ARCH 175 **Projection:** Europe Lambert Conformal Conic projection Data: Atlas of Early Printing, Digital Atlas of Roman and Medieval Civilizations, Natural Earth

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