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# Preserving complex digital objects in the GLAM community through Digital Humanities

A study on Ancient Indian scripts

Ashwin Kumar Kushwaha & Ajay Pratap Singh

Banaras Hindu University, INDIA

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# speaker(s)



## **ASHWIN KUMAR KUSHWAHA**

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Junior Research Fellow, Banaras Hindu University, INDIA



# speaker(s)



## **AJAY PRATAP SINGH**

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Professor, Banaras Hindu University, INDIA  
Director General, RRRLF, Kolkata, INDIA



# Agenda

- Motivation of the study
- Understanding the concept
- Findings of the study
- Challenges in the study
- Conclusion



# Motivation

- Role of GLAM community of India
- Challenges in unearthing the scholarly knowledge in scripts
- Inability of NMM (National Mission for Manuscript) to ensure all-round support to scholarly community



# Concept: Digital Humanities

“Modelling and recording traditional humanities data sets in such a way that they can be read by both humans and machines.”

*- Steven Hayes, University of Sydney, Australia*

“Using digital media to explore, create, analyze and decode meanings in cultural products, current affairs and social life.”

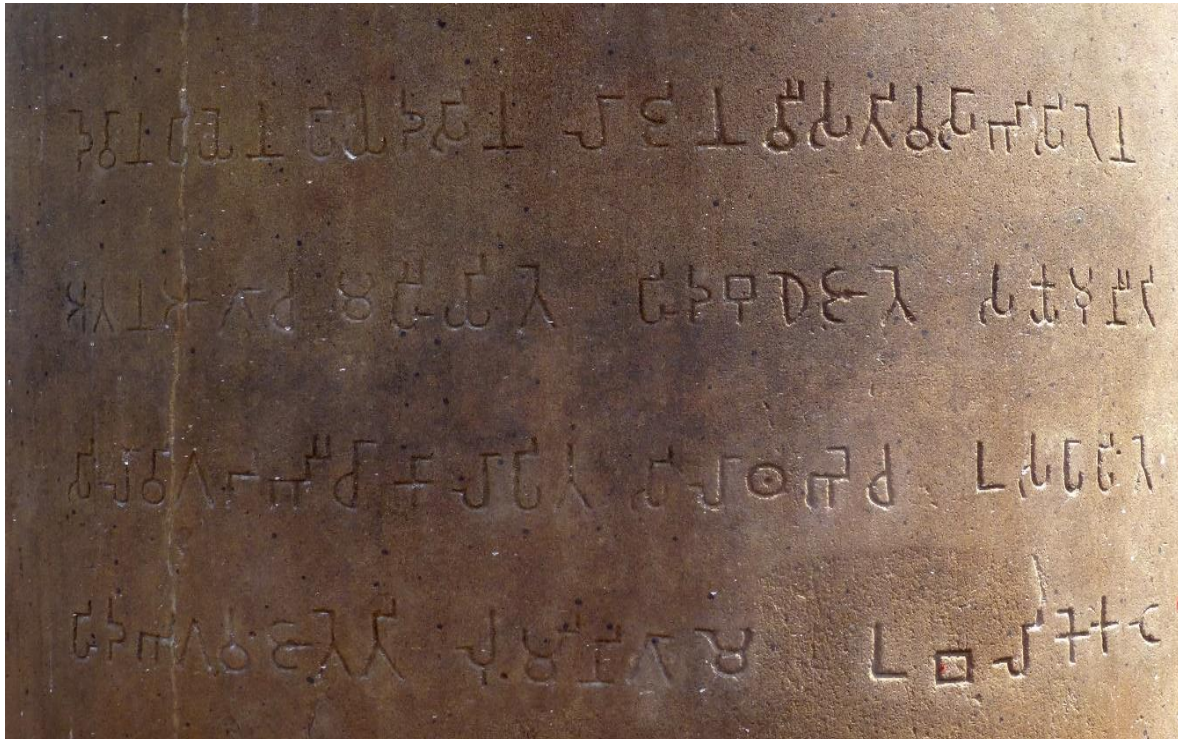
*- Alex Sevigny, McMaster University, Canada*

<http://ccftp.scu.edu.cn/Download/505594d1-330f-4831-94a1-ec87d218345a.pdf>





# Concept : Brahmi Script



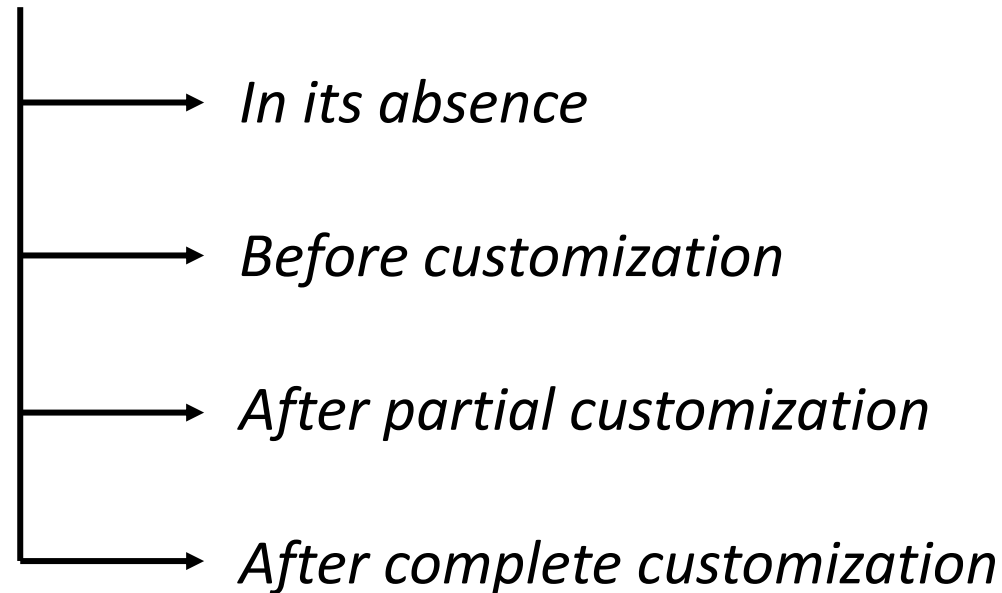
*“The Rummindei pillar edict in Lumbini”*

Source: <https://commons.wikimedia.org/w/index.php?curid=37363661>



# Concept : Work done!

- Deployment of Brahmi script based collections
- Experimentation in JUXTA

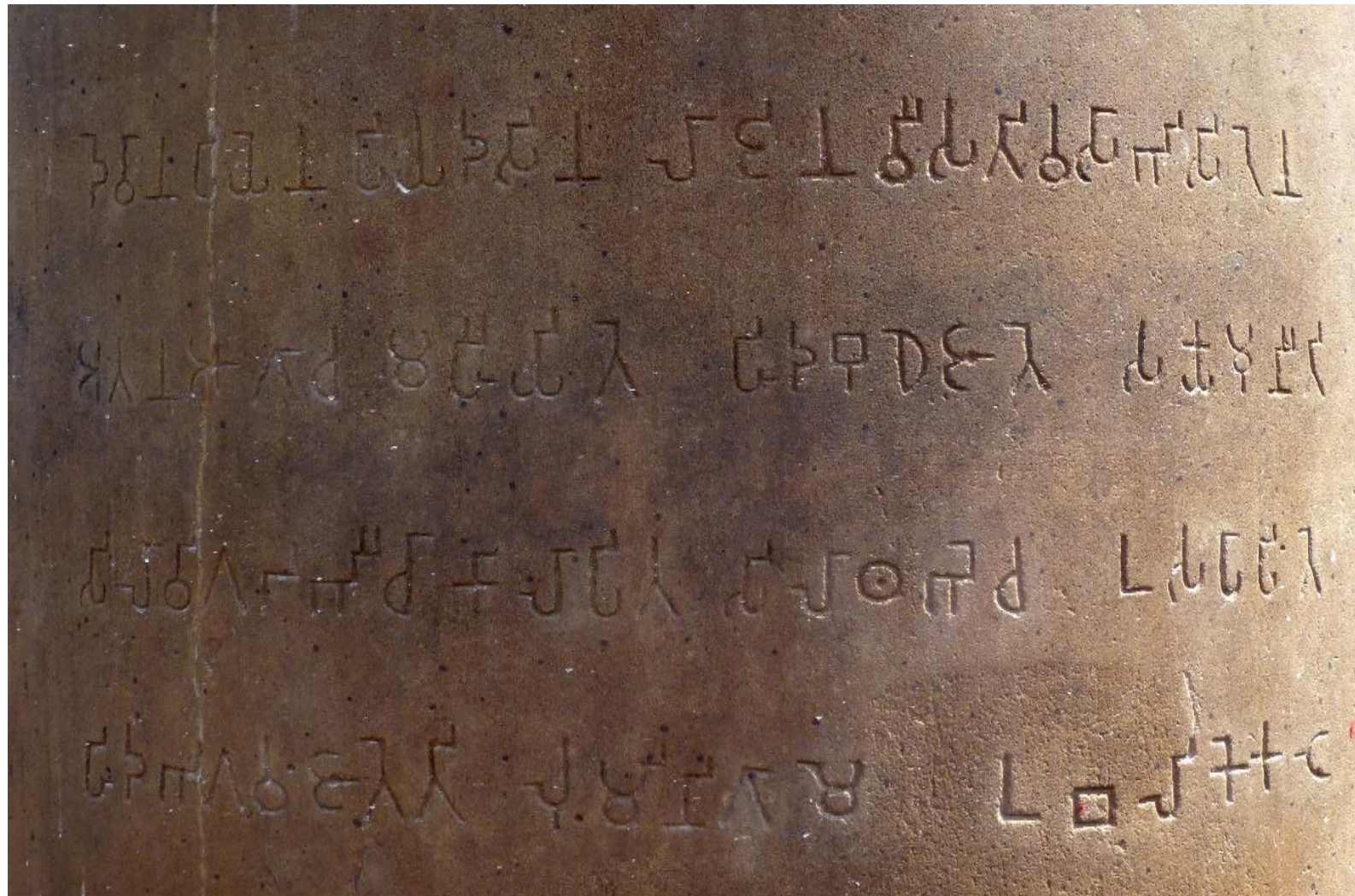


# Concept : JUXTA

- “Juxta is an open-source cross-platform tool for comparing and collating multiple witnesses to a single textual work”
- It is a java-based application and can run on any personal computer







*“Document in the  
absence of Juxta”*

## Rummindei pillar.xml

### TRANSLITERATION (ORIGINAL BRAHMI SCRIPT)

Dev??na?piyena Piyadasina l??jina v?sati-vas??bhisitena  
atana ??g??ca mah?yite hida Budhe j??te Sakyamuni ti  
sil?? viga??abh? c?? k??l??pita sil??-thabhe ca usap??pite  
hida Bhagava? j??te ti Lu?mini-g??me ubalike ka?e  
a?ha-bh??giye ca

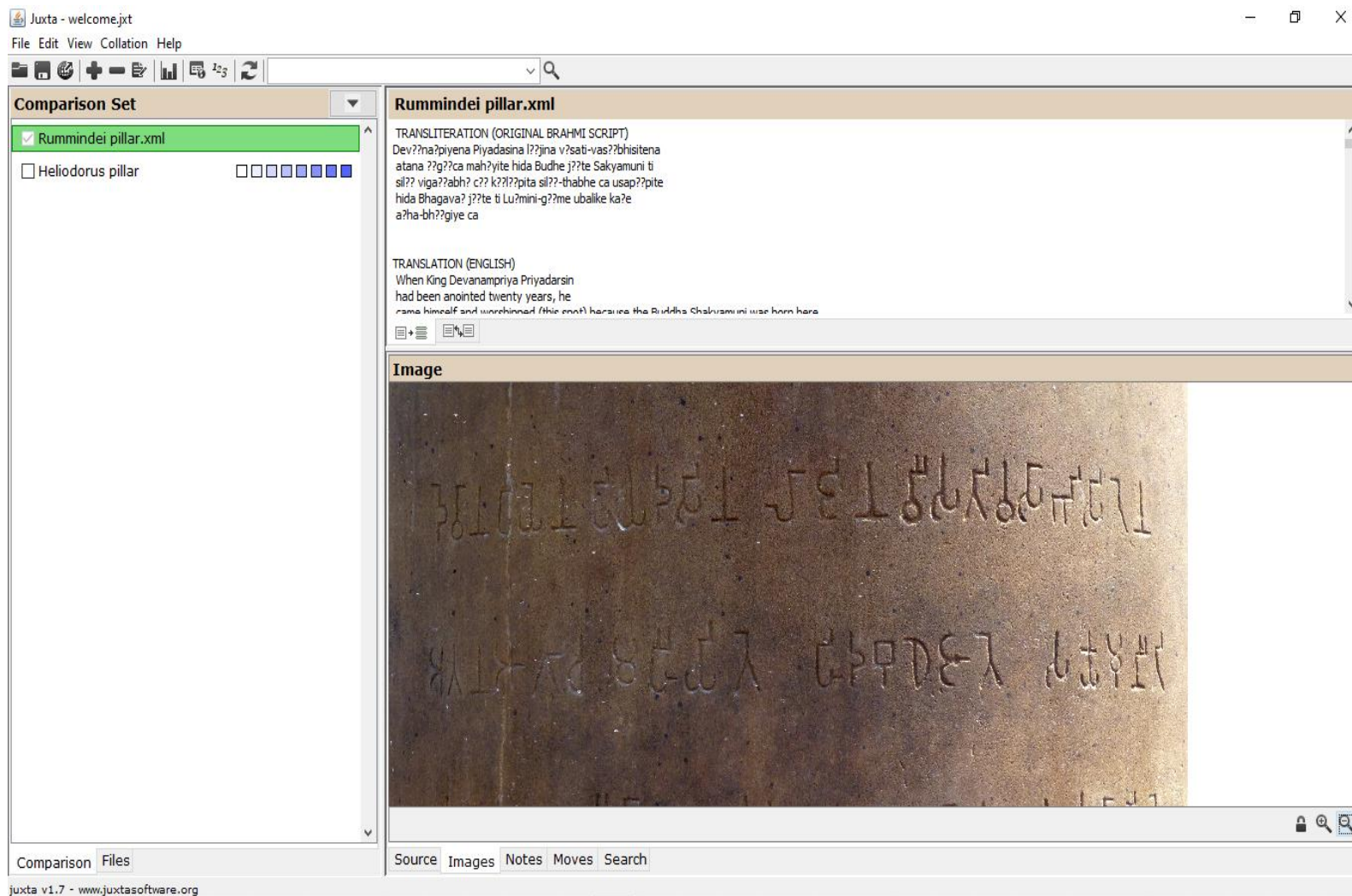
### TRANSLATION (ENGLISH)

When King Devanampriya Priyadarsin  
had been anointed twenty years, he  
came himself and worshipped (this spot) because the Buddha Shakyamuni was born here.  
(He) both caused to be made a stone bearing a  
horse (?) and caused a stone pillar to  
be set up, (in order to show) that the  
Blessed One was born here. (He)  
made the village of Lummini free of  
taxes, and paying (only) an eighth share (of the produce).



*“Document before  
customization in Juxta”*





*“Document after  
partial customization  
in Juxta”*





| Rummindei pillar.xml   | Rummindei pillar-edit.xml  |
|--|--|
| <p>TRANSLITERATION (ORIGINAL BRAHMI SCRIPT)</p> <p>Dev??na?piyena Piyadasina l??jina v?sati-vas??bhisitena<br/>           atana ??g??ca mah?yite hida Budhe j??te Sakyamuni ti<br/>           sil?? viga??abh? c?? k??l??pita sil??-thabhe ca usap??pite<br/>           hida Bhagava? j??te ti Lu?mini-g??me ubalike ka?e<br/>           a?ha-bh??giye ca</p>  | <p>TRANSLITERATION (ORIGINAL BRAHMI SCRIPT)</p> <p>Devānampiyena Piyadasina lājina visati-vasābhisitena<br/>           atana āgāca mahiyite hida Budhe jāte Sakyamuni ti<br/>           silā vigadabhi cā kālāpita silā-thabhe ca usapāpite<br/>           hida Bhagavam jāte ti Lummini-gāme ubalike kate<br/>           atha-bhāgiye ca</p>  |
| <p>TRANSLATION (ENGLISH)</p> <p>When King Devanampriya Priyadarsin<br/>           had been anointed twenty years, he<br/>           came himself and worshipped (this spot) because the Buddha<br/>           Shakyamuni was born here.<br/>           (He) both caused to be made a stone bearing a<br/>           horse (?) and caused a stone pillar to<br/>           be set up, (in order to show) that the<br/>           Blessed One was born here. (He)<br/>           made the village of Lummini free of<br/>           taxes, and paying (only) an eighth share (of the produce).</p> | <p>TRANSLATION (ENGLISH)</p> <p>When King Devanampriya Priyadarsin<br/>           had been anointed twenty years, he<br/>           came himself and worshipped (this spot) because the Buddha<br/>           Shakyamuni was born here.<br/>           (He) both caused to be made a stone bearing a<br/>           horse (?) and caused a stone pillar to<br/>           be set up, (in order to show) that the<br/>           Blessed One was born here. (He)<br/>           made the village of Lummini free of<br/>           taxes, and paying (only) an eighth share (of the produce).</p> |

*“Document after customization in Juxta”*



# Findings

- Deployed collection was less susceptible to obsolescence
- Guarantees preservation of Manuscripts
- Unfolds infinite dimensions/possibilities to do research for the scholarly community





Juxta - welcome.jxt  
File Edit View Collation Help

Comparison Set

- Rummindei pillar-edit-edit.xml
- Heliodorus pillar

Rummindei pillar-edit-edit.xml

TRANSLITERATION (ORIGINAL BRAHMI SCRIPT)

Dev??na?piyena Piyadasina l??jina v?sati-vas??bhisitena atana ??g??ca mah?yite hida Budhe j??te Sakyamuni ti sil?? viga??abh? c?? k??l??pita sil??-thabhe ca usap??pite hida Bhagava? j??te ti Lu?mini-g??me ubalike ka?e a?ha-bh??giye ca

TRANSLATION (ENGLISH)

When King Devanampriya Priyadarsin had been anointed twenty years, he came himself and worshipped (this spot) because the Buddha Shakyamuni was born here. (He) both caused to be made a stone bearing a horse (?) and caused a stone pillar to be set up, (in order to show) that the Blessed One was born here. (He) made the village of Lummini free of taxes, and paying (only) an eighth share (of the produce).

Heliodorus pillar

TRANSLITERATION (ORIGINAL BRAHMI SCRIPT)

Devadevasa V??[sude]vasa Garu??adhvaje aya□ karito i[a] Heliodore□a bh??gavatenena Diyasa putre□a Takhhasil??kena Yonadatena agatena mah??r??jasa A□talikitasa upa□[□]t?? samk??sam-raño K??siput[r]asa [Bh]??gabhadrasa tr??t??rasa vasena [catu]dase□na r??jena vadham??nasa

Trini amuta??p??d??ni (i me) (su)anuthit??ni neyamti sva(gam) dama c??ga apram??da

TRANSLATION (ENGLISH)

This Garuda-standard of V??sudeva, the God of Gods was erected here by the devotee Heliodoros, the son of Dion, a man of Taxila, sent by the Great Yona King Antialkidas, as ambassador to King Kasiputra Bhagabhadra, the Savior son of the princess from Varanasi, in the fourteenth year of his reign.

Rummindei pillar-edit-edit.xml - Source

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<short-title>Rummindei pillar</short-title>
<author></author>
<editor></editor>
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<date>248 BCE</date>
```

Comparison Files

Source Images Notes Moves Search

juxta v1.7 - www.juxtasoftware.org

*Comparison view – one of the dimension from infinite dimensions*



# Challenges in the study

- Scarcity of Ancient Indian images
- Translation and Transliteration work due to pandemic
- Text encoding for some characters
- Lack of syntactic and semantic knowledge



# Conclusion

- XML is appropriate for long term preservation
- Sustainability of Juxta
- JUXTA and Complex Digital Objects

# thank you

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<https://www.ifla.org/it>

