

Significant properties of complex digital artifacts

Open issues from a video game case study

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In this poster we present the preliminary output of a study meant to analyze the applicability of the InSPECT assessment framework to a particular kind of complex digital artifact: video games.

Complexity and Significant Properties

The *Investigating the Significant Properties of Electronic Content Over Time* (InSPECT) Assessment Framework was developed to help digital curators identify and select significant properties to be preserved.

The framework has been tested and evaluated against four basic object types: Audio Recordings, Structured Text, Raster Images, and E-mail. These object types, while common, are not representative of the entire population of digital artifacts, justifying an investigation into the framework's performance in terms of scalability and expressiveness with more complex artifacts.

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Object type identification

"The evaluator analyses a representative sample of an object type, identifies a set of functions and behaviors that may be achieved, and the properties that are necessary for their performance".

- **Is there a type?** Video games manifest an extreme degree of variation in content and expected behaviors that challenges the assignment of a clearly defined set of significant properties to the whole class of such objects.
- **Type vs. Instances:** While video game is an object type, the core properties that can be assigned at this general level do not seem sufficient to assess preservation of any specific video game instance.

An example

Consider video frame rate:

- It is very significant for a certain kinds of video games (e.g. **first-person shooters**)
- It is most likely less so for other kinds of games (e.g., **digital board games** such as Go or chess).



The notion of Object Type is slippery

Entity conflation & properties assignment

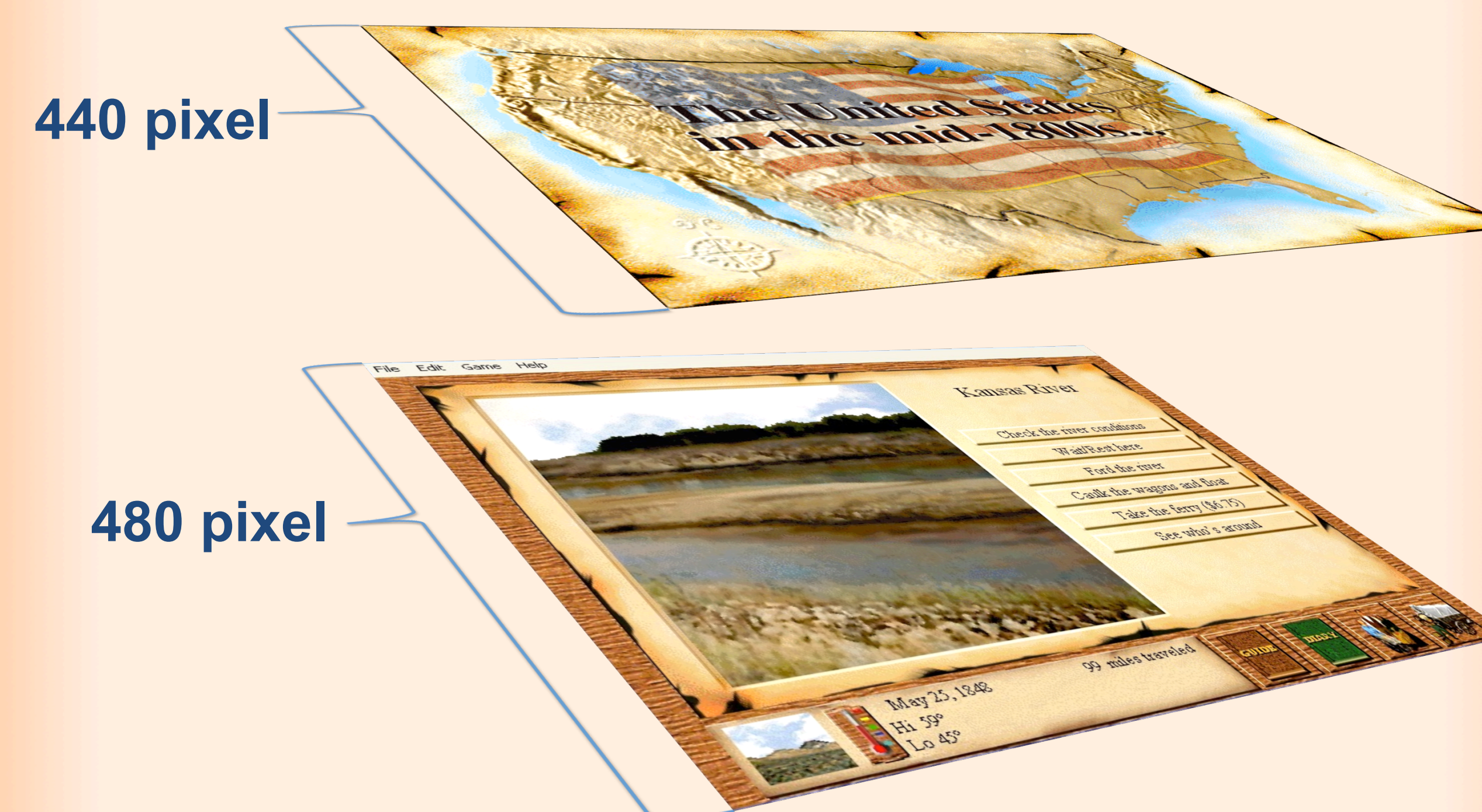
InSPECT identifies structural properties meant to "describe the extrinsic or intrinsic relationship between two or more types of content, as required to reconstruct the performance".

- **Components of Video Games:** they are not ancillary objects that possibly stand in a relation with the video game, they necessarily participate in the identity construction of the game itself.
- **The network of dependencies:** the relation between components — and the way they participate in instantiating the video game — is more than a structural relation between content types.

An example

Consider the characteristic of having a particular on-screen resolution:

- Oregon Trail II, as a game, has a resolution of **640x480 pixel**.
- The videos included in the Macintosh version of the game have a resolution of **640x440 pixel**.



The same property, namely "having a particular resolution", has a different value for game components and a different significance. Therefore two different significant properties must be recorded and assigned to the correct entities: the game and a specific component — a video — of the game.

Strategies need to be identified to adapt the InSPECT framework workflow to compositionality

Data Objects and significance

InSPECT assumes a consistency of functionality for Information Objects of a particular object type for which significant properties are identified.

- **Consistency:** object type consistency does not appear to exist in the case of complex digital artifacts such as games.
- **Data Objects:** there is a level of significance connected to the specific Data Object we chose (or are forced to choose) as preservation object, but separate from that of the information object.

An example

We have examined several versions of **Oregon Trail** within our research:

- Two of the early versions are BASIC programs written for CDC mainframes for which we have the source code.
- Oregon Trail II is distributed on a CD-ROM that includes both the Windows and the Macintosh version of the game, but for which source code is not available.

While these versions are clearly of the same object type their functionality (and significant properties) are very different.

- Availability of **source code** enables a variety of stakeholder actions not feasible with a binary version, even though both can support the "functions that have been defined by the creator."
- The CD-ROM ISO for Oregon Trail II contains the **Windows** and the **Macintosh** manifestations of the game, only one of which feature video, and which enables functions for a stakeholder that preserving an installed instance of the game would not.



Different manifestations enable different functionality for users, and enable and constrain different actions on the part of curators

Conclusion

Complex digital artifact manifest representation issues that were not covered in the InSPECT case studies. We believe the result to contribute to the discussion on significant property as a central concept in the development of preservation strategies for complex digital artifacts.

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Acknowledgments

The Preserving Virtual Worlds II project has been made possible by funding from the Institute for Museum & Library Services (Grant no. LG-06-10-0160-10).

Simone Sacchi would like to thank the PVW2 group for the opportunity to join the team, and in particular Jerome McDonough the many inspirations.

