Thinking Inside the XBox: Elements of Information Organization in Video Games

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ABSTRACT
Video games are a novel and unique context in which numerous principles of information organization can be observed. In this poster, we explore the intersection of video games and formal information organization by examining several examples from popular video games. By doing so, we highlight some of the common organization principles that are applied in video game design, and perhaps discover new ways of organizing information objects and assess their application in real life contexts.

Categories and Subject Descriptors
H.1.m [**Information Systems**]: Models and Principles: Miscellaneous

General Terms
Design, Theory.

Keywords
Video Games, Inventory Systems, Metadata, Mnemonic Notation.

1. INTRODUCTION
Information organization (IO) in virtual environment such as video games is an important issue, just as in real life. Take, for example, video games in which players must manage collections of skills and items obtained by their characters. The careful organization of these virtual objects is critical for improving the overall gaming experience. The inventory can drastically affect the pace of the game [3] and a non-successful inventory system can result in user frustration and possibly failure. Beyond inventory systems, video games contain many elements which are essentially IO problems, including shopping interfaces for purchasing items and upgrades; encyclopedias of back-story and in-game details; journals of player actions and objectives; battle systems and controls for selecting and executing actions; character profiles and development systems; guild management; etc.

As fictional, virtual worlds, video games present an opportunity for designers to construct any kind of organization system, unrestricted by the limitations of real-world constraints. Organizing information objects in video games presents different set of several interesting design challenges, such as i) the limited size of the whole inventory system in order to prevent player confusion, ii) limited space in which to present the information to the players, and iii) limited time to convey all the information to the players so that they can manage their inventories effectively, to name a few. Each game is unique, leading to possibly as many different organization systems as there are games, yet players are able to quickly learn and use these systems, some of which are very complex. What kinds of systems do game developers design, and in what ways are they similar to (or different from) each other, and also traditional IO systems? Despite removing the constraints of the real world, are similar issues or challenges in organizing information objects evident in video games? Are the constraints affecting video games unique to this context? Can these systems inform our understanding of IO more broadly? Can the IO systems and principles found in video games tell us anything about the sophistication of users, or how to effectively instruct users in the usage of these systems?

As a first step towards understanding these many issues, we explore the intersection of video games and formal IO in this poster. Specifically, we wish to highlight some of the common organization principles that are applied in video game design, and perhaps discover new ways of organizing information objects and assess their application in real life contexts. In order to begin this exploration, we present several examples taken from popular video games. These examples are just three points in a large design space, and they are intended to illustrate the motivations for this poster. There are many inventive and novel systems developed by game designers, some which bear similarity to "traditional" IO systems, but others which do not. Yet, they might hold some insight into how information can be organized and represented in a compact, usable, and potentially fun way.

2. MOTIVATING EXAMPLES
2.1 Rich Information Objects and Metadata
The issue of effectively organizing objects and metadata associated with those objects is not mitigated by the virtual-nature of video games. Typically in role-playing and adventure games, the playable character will acquire various weapons, items, etc. throughout the game. Often these objects have a number of characteristics (i.e., metadata) such as the conditions in which the object can be used, skills associated with the object, and so on. Organizing and displaying all this information in a limited space, for a mixture of objects, requires innovative designs. As an example, Figure 1 shows a screenshot of a "persona" from the

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game Shin Megami Tensei: Persona 3. The persona works like a weapon, equippable by the main character for battles. There are 146 different personae types in 21 different classes, which possess distinctive attributes. An impressive amount of information associated with one instance of the persona "Vetala" is presented on a single screen - to be exact, 22 different types of information. (e.g., vulnerability on different types of attacks, individual levels of five different attributes [strength, magic, endurance, agility and luck], current level, name of the persona, arcana, various fusion requirements, image). We can see that various icons, color-coding schemes, and abbreviations are used to present a lot of information in a limited amount of space.

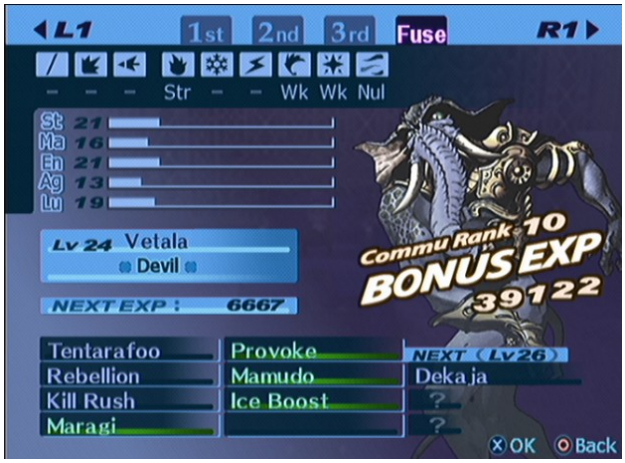

Figure 1. Screenshot of Persona 3.

2.2 Size-based Inventory System

A good inventory system facilitates mechanisms for easy browsing and retrieval of the items during the various stages throughout the games. The styles of inventory systems vary depending on the types and levels of complexity of the game itself [4]. A size-based inventory is one of the many different types of inventory systems in games such as Diablo 2, Dungeon Siege, etc.

Figure 2. Screenshot of Diablo 2 Inventory System.

Figure 2 shows a screenshot of the inventory system in Diablo 2. Each weapon and armor will take up certain amount of space on the grid which represents the size of the inventory as a whole. It is a clever way to organize and present information which prioritizes space as a constraint – something which libraries historically have had to deal with but is rarely discussed explicitly in most digital systems. It is possible to imagine a similar system for organizing digital objects, like files on our computers or applications on mobile phones, which are space constrained. Instead of displaying all icons as the same size, sizes could be varied to represent different features of the objects (e.g., usage).

2.3 Mnemonic Notation

Major classification schemes such as Dewey Decimal or Colon Classification typically employ some sort of mnemonic device for creating a classification notation. (e.g., [1], [2]) This enables users to better understand and predict the structure of the scheme, facilitating the use of the classification system. Mnemonic devices are often used in various components of video games such as the names of various spells and skills (e.g., Final Fantasy series, Persona series, Lost Odyssey, Blue Dragon). As an example, Table 1 lists the different kinds of destructive magic from Persona 3. Different suffixes (e.g., -la, -ga for level 2, -dyne for level 3) are used to denote the strength of the magic attacks and the prefix "ma" is used to denote attacks on multiple targets.

Table 1. Destructive magic from Persona 3

Single Target			Multiple Targets		
Lvl 1	**Lvl 2**	**Lvl 3**	**Lvl 1**	**Lvl 2**	**Lvl 3**
Agi	Agi**lao**	Agi**dyne**	**Ma**ragi	**Ma**ragion	**Ma**ragidyne
Bufu	Bufu**la**	Bufu**dyne**	**Ma**bufu	**Ma**bufula	**Ma**bufudyne
Zio	Zio**nga**	Zio**dyne**	**Ma**zio	**Ma**zionga	**Ma**ziodyne
Garu	Garu**la**	Garu**dyne**	**Ma**garu	**Ma**garula	**Ma**garudyne

3. CONCLUSIONS AND FUTURE WORK

We presented several examples in this poster in order to highlight just a few of the many aspects of IO which can be seen and studied in video games. These examples embody elements of metadata description and display, faceted classification, mnemonic notation, usability, and accessibility, to name a few. What is most compelling about IO in video games is how sophisticated and diverse the systems can be, yet players are still able to learn and adapt to the systems with relative ease.

Necessarily, we have raised more questions than answers in this poster as we embark on a new research path. In future work, we plan to conduct a detailed analysis of the history of inventory systems in video games and compare it to the history of formal classification systems. We also expect to show many more examples from various games that can inspire better tools and techniques for information organization in the real environment.

4. REFERENCES

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