Comparing Computer and Traditional Games Using Game Design Patterns

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ABSTRACT
This paper uses a game design patterns approach in a comparison of the popular Real-Time Strategy (RTS) computer game, Warcraft III by Blizzard, and the popular non-computer strategic board game, Risk by Parker Brothers.

The aim is to explore the feasibility of using such an approach to identify differences that would be useful in converting other non-computer based gameplay into computer game designs. While more comparisons are still needed, the differences already identified can be used as high-likelihood candidates in attempts to adapt other non-computer games into successful computer game designs. They may also be useful in attempts to make existing computer-based games or simulations more attractive by better leveraging the strengths of the medium.

The paper concludes with a discussion on other uses and insights that could be gained from such comparisons, and future work.

Categories and Subject Descriptors
K.8.0 [**Personal Computing**]: General – *Games*

General Terms
Design

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1. INTRODUCTION
Existing non-computer games have often been a source of gameplay ideas and concepts for computer games. Particularly in the case of widely popular or long-lived traditional games, the game dynamics have proven themselves attractive to a large number of players, and it makes sense to try to replicate the same attractiveness in a computer-based medium.

However, such attempts are not always successful. This can be due to attempting to replicate the original game too rigidly, without modifications to accommodate the strengths and limitations of a computer-based format in comparison to the original format. In the worst case, this could produce a game which not only does not reproduce the gameplay strengths of the original game, but also lacks the attractive elements of many other computer games.

By comparing a popularly successful computer game and a popularly successful non-computer game with similarities in core gameplay, this paper aims to identify differences in game design that allow the shared core gameplay to retain its attractiveness despite the difference in medium. It is hoped that this can then be used to develop translation techniques for more successfully converting other non-computer gameplay to computer game designs. This paper presents the results from such a comparison, analysis, and possibilities for further research.

2. BACKGROUND
Game design patterns are a relatively new tool for analyzing computer games. Björk and Holopainen [2005] compiled and classified 296 game design patterns and their inter-relations, and proposed possible applications. These provide a rather comprehensive framework for the analysis of gameplay elements in games and the relationships between them, and a common vocabulary for describing game design elements and concepts. One use proposed by Björk and Holopainen is the categorization of collections of computer games according to their similarities and differences in game design patterns, in order to identify or understand genres.

Instead of performing such an analysis on computer games alone, this paper proposes to compare a popularly successful computer game and a popularly successful non-computer game with similar core gameplay, to assess whether such an approach would be useful in identifying game design patterns that contribute to successful adaptation for the computer-based medium.

If found to be feasible, game design patterns identified in this manner would be useful for translating the core gameplay from other popular non-computer games into potentially popular computer-based gameplay. This would provide an additional tool for deriving new computer game designs. It would also be useful in improving the attractiveness of computer-based serious games or military simulations.

3. IDENTIFICATION OF CANDIDATES
Comparing two games with close similarities in core gameplay would allow easier identification of game design patterns that are adaptations for the computer medium, avoiding confusion

between these and patterns that reflect differences in core gameplay dynamics or genre-based differences.

Considering this, strategic games are a good choice for such a comparison, as there exists a clear and obvious analogue between strategic board games and many computer-based strategy games. Similarities start from the multi-player, generally symmetric nature of play, to the goals which involve the elimination of other players through simulated military conflict, to the gameplay focus of making strategic decisions to achieve these goals.

3.1 The Game of Risk

Due to its widespread and continued popularity, Risk is a natural choice. It is arguably even the source of many of the gameplay elements found in computer-based strategy games. While it may not be possible to accurately trace the evolutionary relationship between Risk and any particular computer-based strategy game, there should still be sufficient parallels in design to allow the postulation of a hypothetical direct derivation to be instructive for future gameplay derivation attempts.

Both a reason and a result of the long-lived popularity of Risk is the evolution of multiple variants on the original rules, which often arise from the player community. These include differences in army movement, card values, alliances and team games, and large-scale tournaments with elaborate rules, as well as asymmetrical goals in the form of 'secret missions'. Many of these are widely accepted and played, and some are even included in the standard rule book distributed with the game. These should therefore be considered in the comparison as well, as they form part of the basis for the continuing popularity of Risk.

While not included in this comparison, it is also interesting to note that several computer-based implementations of Risk or Risk-like gameplay (e.g. Conquer Club), have additional innovations that attempt to adapt gameplay to better suit the computer-based medium. One notable addition is a "freestyle, no double-turns" sequence of play to cater to unpredictable player presence in a casual gaming environment, while preventing an unfair advantage gained by a player taking two turns in a row. These could be contrasted to the differences identified by the comparison performed in this paper, as possibly similar, but more limited, adaptations for the computer medium.

3.2 The Game of Warcraft III

The real-time strategy (RTS) genre presents good candidates for such a comparison as their exciting multi-player play appears to take fuller advantage of the possibilities of the computer medium. Other popular turn-based strategic games such as the Civilization or Galactic Civilizations series have also been generally single-player games, which presents a departure in core gameplay from the multi-player nature of Risk.

Warcraft III by Blizzard Entertainment is a good example of a recent Real-Time Strategy (RTS) game and presents a very popular refinement of the RTS format. While Warcraft III contains both single-player and multi-player modes of play, the structure, design, and resultant gameplay of the single-player mode is markedly different, focusing more on narrative and asymmetrical challenges or puzzles, and significantly differs from the core multi-player strategic gameplay of Risk. This comparison therefore focuses on the multi-player mode of Warcraft III.

Player-originated variations in Warcraft III can be very significant, taking the form of community-created maps which provide wildly different gameplay experiences, and have wide distribution through the internet. These not only include alterations to the physical map of the game world, but include significantly different player goals. Examples include tower defense, first person shooters, and character development-focused role-playing game type maps. The most popular of these, i.e. DotA AllStars[1] and similar variants, have possibly outstripped the original game in popularity and market longevity.

As the variations in gameplay in these variants can be so drastic, taking all of them into consideration for this comparison could lead to a loss in focus by causing the identification of almost every single game design pattern. As many of these variants are popular only with niche groups of players, this comparison will take into consideration the most popular variants.

Somewhat ironically, a strategic board game, Warcraft: the Board Game, was also created based on the gameplay of Warcraft III. This could be considered an example of a reverse derivation, and it would be interesting to look at it in the light of the results of this comparison.

4. METHODOLOGY

Game design patterns are classified as being inter-related in three ways: instantiates/instantiated by; modulates/modulated by; and potentially conflicting. Conceptual visualization of these relationships is made much easier by the work of Tolmie [2005], which provides a visual reference of the groupings and inter-relations of the different game design patterns.

Björk and Holopainen proposed a mixture of structural analysis and playtesting as the most efficient way of identifying the game design patterns that exist in a game. Initial analysis consists of identifying the existence or absence of each game design pattern in a game. This provides a basis for further analysis.

Initial identification of presence of game design patterns was performed by iteratively considering each game design pattern from the context of both games, informed by playtesting. This was supplemented with structural analysis based on the rules and manuals of the games. Additional playtesting was undertaken to confirm some patterns, together with the surveying of online sources for player gameplay experiences.

Since some design patterns may exist only under certain special conditions or be emergent only under rare circumstances, this analysis attempts to characterize each game only according to common ways by which they are played or accepted to be played. This is because the analysis aims to identify the patterns that are related to the popularity of the games, and these would be present in the most popular, commonly-played forms of the games.

5. RESULT

The results of the comparison are represented in Figure 1. The game design patterns are classified according to the groupings specified by Björk and Holopainen, which are based upon their concept of an activity-based component framework. For easier correlation, each group is also highlighted in a color closely resembling those used by Tolmie.

6. ANALYSIS

The comparison between the two games reveals significantly more game design patterns that are in Warcraft III, but not in Risk, than vice versa. This implies an increase in the number of gameplay elements in Warcraft III, and an examination of the differences reflects an increase in the level of depth and complexity of gameplay.

In addition, a number of shared game design patterns, while present in both games, had noticeable differences in the degree to which they are implemented. In general, these can also be described as being implemented with more complexity and depth in Warcraft III than in Risk. For example, while a **hierarchy of goals** might exist in both games, the hierarchy is much deeper and more complex in Warcraft III, where goals not only include attacking and defending territories, but also include securing resources, upgrading units, building up the economy, exploring the map.

In most cases, differences can be found to be related to the shift from **self-facilitated games** to computer-facilitated games. The computational power of a computer-based system allows games to contain much more complex game mechanics and calculations as they can be automatically handled by the computer without overloading the player. This allows the many more patterns in the **Game Elements** and **Actions, Events** categories, with more realistic, complicated mechanics taking the place of more simplistic **dice** and **cards**.

Computer-facilitation also allows more and smaller details and gameplay-related numbers to be accurately taken into account, with much less possibility of cheating. This enables the move to a continuous non-discrete playing field, instead of a **tile**-based world map with discrete territories. Additional variety in **units** and the addition of "races", a form of player asymmetry, also introduces **paper-rock-scissors** gameplay.

Real time games are enabled by the introduction of the computer as it is able to handle simultaneous moves and other inputs from players, resolving any conflicts with undisputed impartiality. This allows the pace of the game to be effectively controlled, introducing a sense of urgency in line with the game design pattern of **the show must go on**. **Turn-taking**, **downtime**, and the possibility of **analysis paralysis** are also eliminated. These greatly contribute to a sense of excitement.

And the introduction of networked play, allowing each player to have a separate terminal and individualized game views, instead of a shared game board, is necessary for the **imperfect information** associated with a **fog of war**, and the additional **Goals of Information and Knowledge** enabled by the resultant **asymmetric information**.

The computational power of the computer also allows the introduction of artificial intelligence **agents** that can take the place of players, allowing players to play with computer-controlled players, both as team-mates or as opponents. This allows the multi-player game to be played by a single human player, and is what enables the development of an asymmetrical single-player mode in Warcraft III.

Lastly, the flexibility of a computer program allows the provision of toolkits and other customization abilities to players, giving them an almost completely **reconfigurable game world**. This allows the creation of player mods and custom maps, such as DotA AllStars, which add even more **varied gameplay**.

From this analysis, it is clear how the differences in game design patterns identified point to adaptations that take advantage of the differences and additional capabilities of the computer medium, compared to the board-game format. These differences should therefore be considered high-likelihood candidates for addition or modification in future attempts to convert non-computer-based gameplay to a computer-based format.

7. FURTHER WORK

A logical next step is the test application of these identified differences, applying these game design patterns in converting gameplay from another board game into a computer game design. Of course this will still require much creative input in deriving the actual form of implementation of the patterns, but it will be an interesting test of whether the identified differences are really able to act as design guidelines for adding attractiveness to computer-based gameplay in comparison to a straight translation of the same game.

Comparisons also need to be carried out between more pairs of computer and non-computer games, for a more empirical analysis of the common differences which exist as a result of the computer/non-computer gap. This would allow a clearer identification of successful adaptations for translation of gameplay from a non-computer medium to a computer game, and possibly vice versa. It would also be useful to test whether each identified adaptation is only relevant to certain genres or kinds of gameplay, e.g. strategy games as compared to manual-dexterity games? At the same time, a larger compilation of analyzed games would allow an analysis of collections of patterns that can be used to identify or understand genres, as envisioned by Björk and Holopainen.

Additionally, it remains to be shown whether gameplay translated from a non-computer medium to a computer game retains attractiveness to its original players, or mainly attracts a new set of players. More comparisons together with player surveys might allow identification of differences that alienate existing players, and those that allow the gameplay to remain attractive to the same group of players. At the same time, it may be possible to comparatively rank the contribution of each of the patterns to the attractiveness of the gameplay, so that more important patterns can be identified..

Finally, such studies could act as a basis for investigating the existence of cultural affinity for certain computer games as a result of genre-like similarities to the traditional games popular in each culture. This would have commercial implications in the design or derivation of computer games to more successfully target specific markets.

8. CONCLUSION

This paper demonstrates a systematic application of game design patterns to a comparison of two popular games with similar core gameplay, one computer-based and one board-based. A significant number of game design patterns were identified as being either shared in both games, or existing in one game but not the other.

While Warcraft III is not a direct derivation from Risk, it shares core gameplay elements that allow both to be classified as multi-player strategic games. This allows the postulation of a hypothetical evolution or derivation process that translates from the game design of Risk to the successful computer-based format of Warcraft III. The differences identified by this comparison point to the adaptations that would be part of this hypothetical derivation process.

From the analysis, the differences can be associated with adaptations that take advantage of the strengths of the computer medium, as compared to the board game format. It is therefore highly likely that application of these game design patterns would be able to provide positive value in future attempts to convert non-computer gameplay to a computer game format. It is also likely that they could be useful in making existing computer-based games or simulations more attractive by helping to identify ways to better leverage these strengths.

While a single comparison is not sufficient to conclude on the correctness or general applicability of the results, the success of this approach in identifying similarities and differences demonstrates the feasibility of this approach for further comparisons in order to obtain more conclusive insights.

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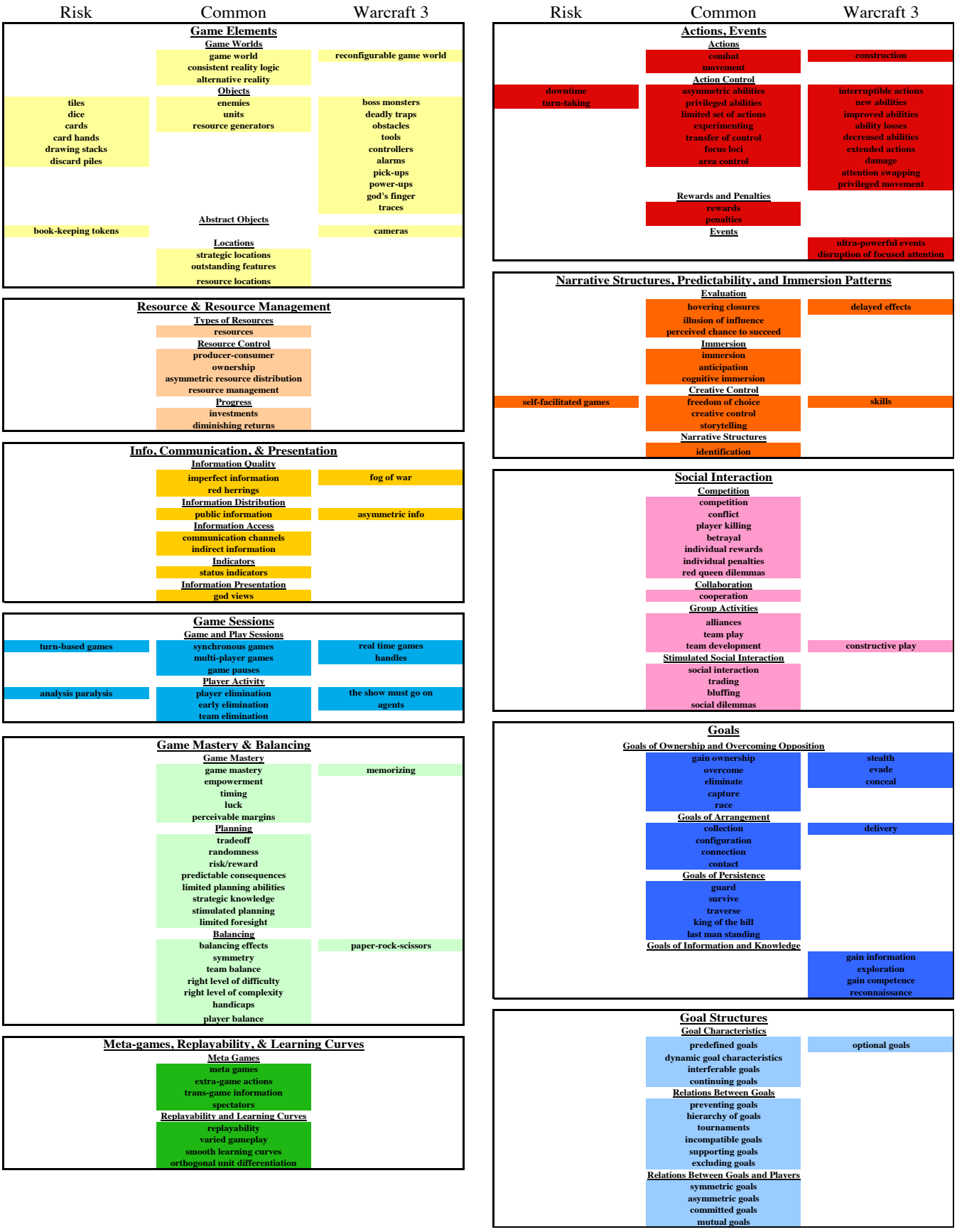

Figure 1: Table of Game Design Patterns Identified in Comparison