

Application of KEEL[®] Technology to Slot Machine “Communities”

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Abstract—Casino Gambling generates a large portion of its revenue from slot machines. Slot machine vendors are always looking for new ways to differentiate their machines from their competitors. Casinos are always looking for new ways to keep the slot machine players involved in the “game” and in the casino. KEEL Technology has the potential of increasing player “involvement” with a particular class of machines by creating a personalized community where the particular player develops a relationship with that community. By integrating an understanding about the player and a “personality” that can track the player, the player will develop a relationship with a particular machine, or a particular class of machines.

Index Terms—Artificial Intelligence, Cognitive Science, Decision-Making, Deductive Databases, Distributed Control, Expert Systems, Graphical Language, Intelligent Actuators, Intelligent Robots, Intelligent Systems, Knowledge Based Systems, Knowledge Representation, Multidimensional Signal Processing, Multivariable Systems, Self Organizing Control

I. INTRODUCTION

THIS document will focus on the capabilities of Knowledge Enhanced Electronic Logic (KEEL[®]) Technology and how these capabilities can support the theme of a slot machine community.

II. A SLOT MACHINE COMMUNITY

A. Justification

Slot Machine vendors have always tried to create machines that attract players attention with colors, flashing lights, and recently with specific themes. The selection of themes are intended to solicit player involvement based on their relationship with the theme. Monopoly and Wheel of Fortune focus on the players familiarity with the board game or the television game show. In these cases the manufacturers have demonstrated the value of tapping-in to the familiarity the player has with the subject matter.

This paper extends this general, loose coupling of machine to player to a more intimate relationship between a machine and a particular player. It also addresses a community of machines, where each player is treated as an individual. This is accomplished by providing a slot machine (or class of

machines) that understands the player as an individual and exhibits emotions associated with its understanding of that player.

Once the player and the machine develop that relationship, the player will become more involved “with” the machine and be more likely to stay in one place and continue to play. And when that relationship is maintained over multiple trips to the casino the player will be likely to introduce other players to the same “community”.

B. A KEEL based Personality

The key aspect of creating this community is to be able to capture the player’s personality and present state of mind and react with a machine that can exhibit emotion that responds to that specific player in a manner that stimulates a desire for continued involvement. KEEL Technology provides a mechanism that can exhibit this personality based on knowledge of the player’s history and specialized inputs that can sense the immediate emotions of the player. The objective may be to have the machine react in a consoling manner, should that be appropriate. Or it could respond in a challenging way that drives the player to compete with the machine. The system could have its own built-in personality based on its “wins and losses”, based on the time of day, day of the week, or based on the convention that is going on at the casino. The designer may include historic data about the player or any other knowledge of the environment that may exist.

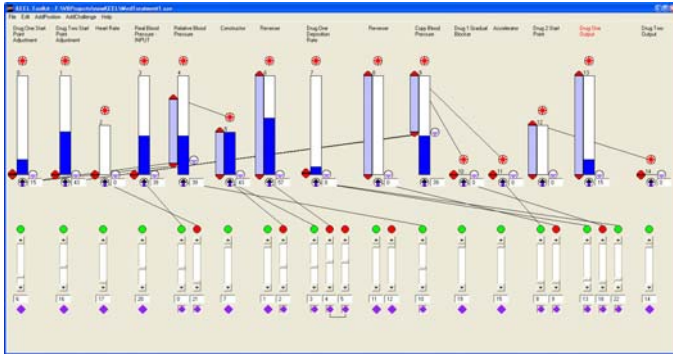
C. Introduction to KEEL

KEEL Technology encompasses:

- A model for human reasoning
- A toolkit for capturing human-like reasoning with a graphical language
- An architecture for a cognitive engine that can be added to devices and software applications

KEEL allows for judgmental, subjective actions to be taken in response to “soft” information. It does this by balancing inputs like humans do when they make subjective decisions. It is based on the concept that human judgmental decisions are based on the evaluation of the importance of information and balancing the impact of one piece of the problem domain against others. Complex decisions and actions (as with emotions) are determined by combining a number of relative (analog) values that are inter-related and then using these values to identify the particular emotion and the extent to

which that emotion should be exhibited. The graphical language integrated into the KEEL Toolkit allows complex subjective reasoning to be modeled.



The KEEL Toolkit allows this complex reasoning to be modeled and tested with relative ease (without resorting to conventional software programming techniques which are difficult to develop and hard to maintain). When the model appears to be correct, it can immediately be translated to conventional source code (C, Java, C#, Visual Basic, Flash,...) for integration into the final product. The small memory footprint and simple application interface (API) allow KEEL Technology to be integrated into many existing designs with relative ease.

The KEEL graphical language is “explicit”, meaning that it is not open to subjective interpretation like the English language. This allows the reasoning model to be reviewed and audited. This is important as it is likely that the personality profiles of the machines will grow over time. The explicit language allows the design to be visualized and *tweaked* with relative ease.

KEEL provides the platform for human-like emotions. It requires a psychologist or human factors specialist to create the appropriate emotional model for the specific type of game selected and for the player personalities. These same “experts” are required to model the emotions of the slot machines so they can react to the specific player personality models.

D. Application of KEEL

Casinos have a long history of gathering player demographics. By gathering general statistics about the level of play at locations throughout the casino, they have learned to structure the layout of their casinos for optimal play. They have gathered studies about color to determine which colors are appropriate for gaming and which are not. With “players cards” they have the ability to track individual players: their wins and losses, the types of games they play, when they play, and where they play.

By adding additional sensors into the game console, they may be able to gather a more immediate view of the emotional state of the player: filtered infrared sensor to detect changes in the player’s face, indicating excitement; pressure sensors in the machine buttons to indicate aggression or dejection; timers

to detect time between plays indicating level of involvement; voice input allowing the player to converse (at least in tone of voice) to determine the mood of the player.

All of these can be inputs that coupled with information from the player’s database (history), can drive the emotional feedback from the KEEL Engine inside of the slot machine.

Feedback can be simply in the form of color, light and audio, projected images, or it can be a built in dialog with the player (one way or two way) that allows the slot machine to respond to the changing mood of the player in the appropriate way.

E. Slot Machine Community

By recording the personal involvement of a player with one machine, the casino will be able to track a particular player as the player moves from one type of game to another. By allowing the slot machine to converse with the player and recognize a change in pattern, the slot machine “community” can adjust the new machine to the specific player’s profile.

F. Summary

Slot machines that can exhibit a personality with emotion that matches players on an individual basis can collect players into virtual communities. When players become part of communities, they are likely to remain in that community because they will be provided with a certain level of comfort. When communities are created within individual casinos, then the casino will have a better opportunity to retain players. Because some casino chains have properties in multiple locations, it will be possible to extend the “communities” to all locations and still retain the same players.

REFERENCES

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Compsim LLC is a technology company providing next generation cognitive technology for application in industrial automation, medical, military, governmental, enterprise software and electronic gaming markets. Compsim licenses its KEEL® technology for application in embedded devices and software applications.

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