An Evolution in Table Game Technology

by Jeremy Rock

For years traditional gamblers have preferred to play table games such as blackjack and poker rather than slot machines as they believed that these games require an element of skill. As such, a skilled player arguably has a chance to compete against the house and hopefully come out a winner. It is also believed that the casinos have a limited ability to control these games and the odds are better with table games vs. those controlled electronically.

This perception may change now that some of the new electronic table game systems are being introduced into the casino environment. These new systems have the ability to track the exact cards and bets that are being played and placed on a game by a player, and the capacity to accurately analyze the player's ability to play the game. While these systems may ultimately reduce card counting and other player advantages over the casinos, there are quite a few positive aspects that players may enjoy from these new systems.

As seasoned players are aware, player tracking systems allow casinos to rate patrons based on their skills and the time and money that each player spends at the property. Players are provided with comps and promotional incentives as a reward for their patronage. Addressed on an automated basis by the slot machines, the table games have traditionally relied on pit bosses and casino management to rate their patrons. This manual rating of players is subjective and in many cases inaccurate. As such, this traditional rating system has not always been fair to either the players or the casinos. This situation may begin to change with the adoption of the new electronic table management systems which have the ability to accurately determine players' skills and ratings. These systems also limit the number of infractions attributable to card counters and other unauthorized methods of gaining the advantage.

There are two key types of technology currently being utilized to track table games: optical scanning and RFID. Predominantly two companies are currently offering these solutions in the gaming industry today. Mindplay (by Bally's) who has focused their technology on optical scanning and Progressive Gaming International (formerly Mikohn) whose solution utilizes RFID. Of note is the recent patent acquisitions of RFID technology for the casino industry by ShuffleMaster. The following represents a review of the different technologies and the advantages and disadvantages of each system.

Optical Scanning

The first technology we will look at is optical scanning. This technology relies on marking playing cards with invisible bar codes and chips with unique "edge" markings on the actual chips. The cards and chips are then read via optical scanners. The scanning technology allows for the dynamic tracking of both

the cards that are being played as well as the bets that are being placed. Additionally a software application analyzes the data collected and provides meaningful real-time reporting and information. The high-tech blackjack table used also looks very similar to that of a traditional table. The only physical distinction is a slim, featureless black console that conceals the cameras in front of the dealer's chip tray. On the console there is also a small liquid-crystal display where the dealer logs players in and out.

The system works something like this. The dealer places shuffled cards in a device that is equipped with an optical scanner. On the side of each playing card, there is an "invisible" ink bar code that contains a unique number for each card. The system reads the stack of cards to know which cards are included in the game and verifies complete decks, which reduces the potential for fraud. The cards are dispensed from the shoe where the optical scanner reads the cards as they are dealt to each player. The system knows in real time what has been dealt and what the players are holding and betting. The betting chips are all designed with striped edge markings in a pattern on the side of them that designate the value of a particular chip. On the table, there is a computer and other scanners that can read the edges of the chips and thereby identify their value and position on the table in real time. Casino management is then able to associate the betting of a particular player and the cards that they are playing. The system also uses an array of 14 concealed cameras as well as image-recognition software to capture and count all wagers.

The key to the system is the actual software application that runs in the background and which contains many algorithms that analyze the information that is provided by the equipment on the table in real time.

RFID Systems

The second gaming technology that is emerging is RFID technology. Typically, RFID involves the placement of RFID tags in the casino chips so that they can be tracked to a player in real time. When chips are issued to a player, they can then be tracked both from a waging standpoint, as well as

Some disadvantages of the optical scanning system are:

- Limited to activity at the table, cannot track the player once they leave the table
- Initial table investment is still fairly substantial
- Questions of how much information can legally be utilized by the casino to manage the game

Big Brother and Some Legal Issues

This new table game technology raises the question as to the legal aspects of these systems. At its basic level, what information can a casino utilize and still keep the game "fair"?

Recently, a number of lawsuits targeted at the various gaming companies and the Nevada State Gaming Control Board alleged that the systems give an unfair advantage to the casino when it comes to managing the information obtained from these systems.

From the player's standpoint, the allegation is that these systems can negatively impact their gambling experience.

- The house can re-shuffle the cards multiple times if they feel that someone may be counting cards or if they feel that a player has a competitive advantage as determined by the system.
- Players should not be discriminated against due to their ability to count cards. Counting cards is not an illegal gaming activity – using a machine or other device to count the cards is. As such, if a player is able to count cards without using any equipment, then that should be their advantage against the house as a skilled or advantaged player.
- Advantaged players are also discriminated against from a point of view of comps and other benefits.

From the casino and gaming company's standpoint, they are quick to point out the following:

- Casino comps are a discretionary benefit and are not a legal gaming requirement.
- Nevada casinos have the right to refuse a patron to gamble. As such, they should not have to allow an advantaged gambler to play when it is to their disadvantage to do so.
- The law requiring an eight-round delay be built into the system still applies. The casino cannot affect play within that timeframe and they are still abiding by the gaming rules and regulations.
- The casinos now have the ability to rate all players. In the past, if you played less than $25 per hand, you were more than likely not rated. As such, these unskilled players typically did not participate in comps. The new systems allow these players to be rated and as such, they become eligible for comps.

Recently, a case was dismissed by a Nevada judge, however you can be sure that other suits will certainly follow.

Advantages of Optical Scanning

- Instant analysis of a player's actual advantage to the game
- Comps that are awarded based on factual amounts, not approximations
- Dynamic comping that focuses efforts on the unskilled (more profitable) player and limits comps for "advantaged" players
- 24/7 software monitoring of card counting and other security concerns
- Instant marketing, surveillance, financial or dealer event alerts
- A non-obtrusive system that can integrate seamlessly with the casino management system
- The initial investment is limited to table equipment, does not require expensive infrastructure related changes required by RFID

Disadvantages of Optical Scanning

- Limited to activity at the table, cannot track the player once they leave the table
- Initial table investment is still fairly substantial
- Questions as to how much of the information can **legally** be utilized by the casino to manage the game

Advantages: of RFID

- A cashier can count 100 of the RFID-tagged chips in seven seconds.
- It provides precise betting and decision analysis.
- By placing transponders in key locations throughout the casino, players activities can be tracked throughout other areas of the facility.
- Dealer's (chip) tips can be tracked.
- Casinos can manage their credit risk. By documenting the name of the players and serial numbers of the chips they lend, if another person returns the chips to the casino, it could identify players that are using their credit lines to make loans.
- Used in conjunction with a table management application, the system can provide the casino with key information relating to its players and their gambling preferences.

Disadvantages of RFID

- Does not record the exact cards dealt to each player, which may introduce some subjectivity on the part of the casino management.
- The current application does not focus on the players' rating as it relates to comps and promotions.
- The cost of installation requires the replacement of chips at roughly three-times the cost of standard chips. There is also the ongoing cost of replacing chips at about 15 percent annually.
- People can tamper with RFID chips thereby circumventing their tracking ability.

that of a location of the player. Whenever a bet is placed, the tag can be identified with a specific game and location. Should the player move to another game or location, his movement can be tracked. This technology coupled with an application that can analyze the real-time data could provide the casino with the ability to analyze a wealth of information pertaining to its clientele.

An RFID system works like this: The gaming tables are equipped with RFID antennae that are located under the table's surface. The antennae pick up signals from the chips and the system displays the information on the dealer's computer screen in real time. The chips are registered to the player tracking card and can be tracked for usage throughout the casino. When a player puts chips in the betting circle, a transceiver under the table detects the amount and adds it to the player's computerized tally. Used in conjunction with an application, player's betting patterns can be analyzed on a real-time basis in order to allow management to accurately rate players and provide them with additional key information about their patron's preferences. The application then analyzes the player's actions to ensure that they do not have the advantage over the house.

Clearly there is merit in both approaches. There are obvious advantages of being able to scan and read every card that is introduced into the game. At the same time, it would appear that the ability to track every single chip and where it travels provides tremendous amount of dynamic information. The key element of the systems is that the table games still look and feel like the traditional games thereby leaving the mainstream players with the same kind of enjoyment that they have traditionally experienced. It is important to recognize that while these technologies provide a tremendous amount of real-time information, the analysis and effective use of the information is what is ultimately critical. The real magic lies in the backend system and the application that interprets the data for management.

There is no doubt that these systems have a ways to go and some key obstacles to overcome, one of which is the potential infringements of the players' rights. However this is clearly the direction that things are headed, and one can foresee future products incorporating both forms of technology in a unified approach. One can also look to the technology expanding into other areas of the hospitality and gaming industries.

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