



LOOKING FOR THE HOLY GRAIL? Casino Table Game Operators Get Intelligent Table Management Equivalent to Slot Machines

By Josh Hoyt, CTO of Holy Grail Technologies

Intelligent Table Management is finally here with high-fidelity data from smart chip tracking to player's analytics

Executive Summary:

Historically table game data analytics and theoretical casino “take” has been a major challenge for the casino industry, sort of “a gamble”. The equation requires making assumptions for the following questions: What are the estimated hands per hour? What is the win-to-lose ratio? What is the estimated volume of the table? What about the “house edge” for the bet? And of course, the player’s performance statistics? Without accurate methods to measure all these factors managing table games has been a major challenge for casino operators.

Although there have been many technological advances in to calculating these factors, the technology has always fallen short... until now! Recently some companies worked together to build The Holy Grail. A solution that combines the latest secure RFID technology with “smart” chips and existing video surveillance to provide an unobtrusive system that reliably tracks wins and losses, in

real-time, offering an augmented reality that functions intuitively. A technology so advanced that can accurately and securely track chips--without slowing down the speed of play, providing business insights to table games that--up to now--has been limited to slot machines.

The intelligent table management solution provides casino operators the ability to accurately measure the number of hands played and the outcome of the games, actual bets placed and tie it to the “house edge” unique for each bet type. High-fidelity tracking of player ID and dealer ID delivers a very rich data set that casinos can leverage to improve floor operations, management, player loyalty programs and dealer training. The application is live today in multiple casinos in California showing improved cash management, event driven security, enhanced player profiles and new training tools to enhance operations across all the table games.

OVERVIEW

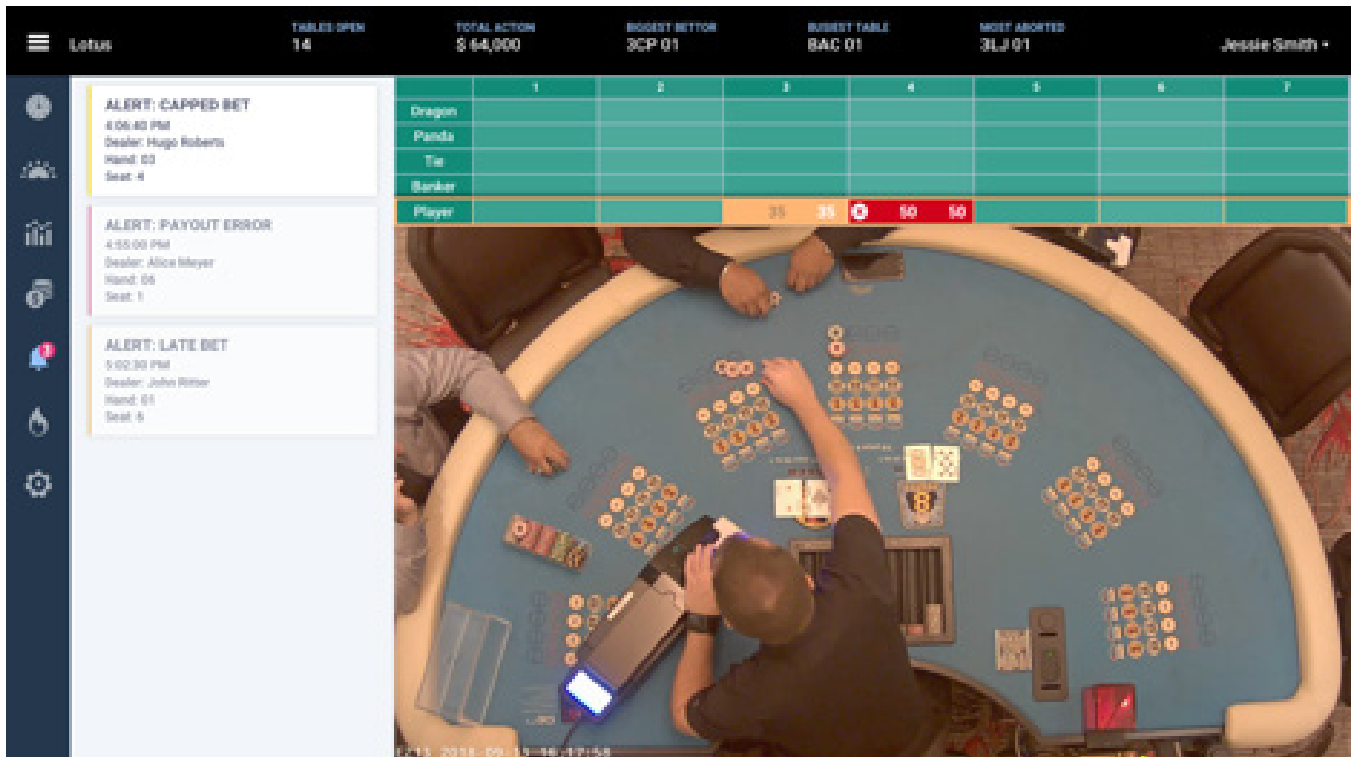
Over the past several years, casino operators have migrated toward slot machines and away from table games. The rationale is simple: electronic machines are much easier to manage and provide a large data stream of information. In contrast, table games have been seen as the “wild west”.

Calculating whether or not table games are profitable depends on a number of interdependent factors in a complex equation: (1) the betting “action”, (2) the speed of play or “hands per hour”, (3) the dealer accuracy, and (4) security and operations. The ability to accurately and securely track chips--without slowing down the speed of play--can provide casino operators the operational oversight and insights for table games that--up to now--have been limited to slot machines. The result: better operational management, improved security, and increased profitability.



Radio frequency identification (RFID) is a proven technology that quickly and accurately delivers large data streams. A wide variety of industries have used this smart technology to their benefit for years, resulting in greater productivity and efficiency, reduced costs and

maximum return on investment (ROI). Now, advanced RFID technology is being used in the gaming industry to help casinos take table games from a difficult to manage enterprise to well managed business with a rich trove of information.



The Holy Grail tracks and logs the dealer and player events with time stamps synchronized with video cameras

In Search of the Holy Grail

Previously, the use of radio frequency technology in gaming applications was of limited value. Early incarnations have been available for over a decade for use in systems that count chips and check for counterfeit chips, but data accuracy was lacking. Specifically, older technologies did not have the spatial accuracy to track individual bets with individual odds.

For most casinos that tried RFID in the past, this solution did not live up to the promise. These early technologies cannot easily identify fraudulent chips at the time that a bet is placed; the systems don't address how much each individual player bets on different bet

types; and data is not collected about what time the bet was placed in a manner synchronized with security cameras.

Holy Grail is a new RFID technique for high-fidelity tracking of player bets and dealer performance, delivering a very rich data set that casinos can leverage to improve floor operations, management, player loyalty programs and dealer training. Even multiple, closely spaced bets can be accurately tracked, without requiring substantive changes in dealer or player behavior, thereby maintaining optimum speed of play.



Data-Driven Casino Operations

Historically, casinos have had to rely more on intuition than data to calculate ROI, based on observational assumptions about average bet size, average speed of play, and assumed odds. But “going with your gut” is not a reliable business case. We all know that bets are not constant, speed of play is governed by multiple variables, and the odds are different for every type of bet.

Prior attempts to leverage RFID for gaming have used omni-directional antennas, which limited the spatial ability of the system. These solutions failed to deliver the accuracy needed to precisely know what bets each individual has made and track the collection of losing bets and payouts for winning bets. With Holy Grail, the collection of high-fidelity data occurs concurrent with game play, producing a rich data set that allows

you to “see” everything that is happening. And unlike proprietary solutions, Holy Grail uses an industry standard for contactless communications, ISO 18000-3 Mode 3 technology, for easy interoperability.

The Holy Grail solution combines the latest RFID technology with “smart” chips to provide an unobtrusive system that reliably tracks actual wins and losses for every hand, delivering hard data. The system seamlessly integrates with existing overhead video surveillance cameras, creating an augmented reality that functions intuitively. This allows security to be managed through an event-based review process, providing a record of activity taking place on the floor at any given time for example “late bet placed on Table 3, seat 4 at 7:15:23 pm”.

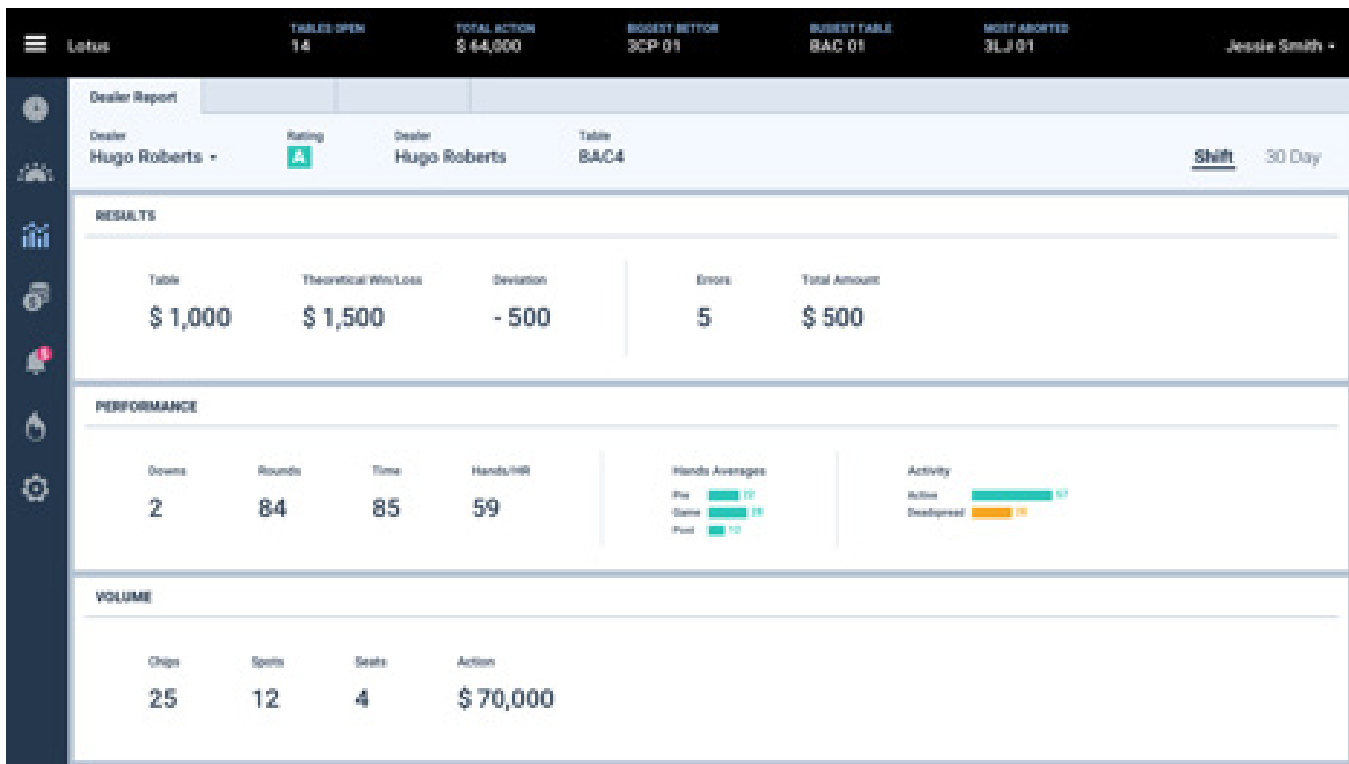
Devil in the Details

The unique difference is that the Holy Grail system sits discreetly beneath the felt. Printed felt layouts and accompanying data management software are available to support a variety of games, including baccarat, blackjack, poker, etc. And due to the accuracy and superior read range of the RFID hardware, bets on a Holy Grail playing field do not need to be widely spaced and back-bettors are encouraged, greatly increasing the “action.” No substantive changes to player or dealer behavior are required to enable tracking. In fact, Holy Grail can easily differentiate between a stack of

30+ chips one bet and a single individual chip sitting on an adjacent betting spot. This ability to add spatial resolution to RFID data is unique to Holy Grail technology.

With advanced RFID reader technology and chips embedded with RFID tags, the Holy Grail system monitors the complete chain of custody as chips travel between the cage, the count room, dealers, tables, and players. With data securely stored in a central repository, the security team can monitor the action from anywhere and respond to specific events in real-time.





Holy Grail provides metrics to casino management on key dealer performance metrics such as results, speed, accuracy and errors for training and performance compensation.

Holy Grail is designed to enable state-of-the-art cash management, security monitoring, fraud detection, dealer performance review, training, and player behavior. For example, casino management can easily recognize if a specific dealer is efficient and accurate, or perhaps needs more training. Additionally, the

versatile way the system is designed means that a range of other benefits can be realized by monitoring gamblers' activity, such as identification of fraud due to moving bets and sleight of hand betting, tracking of stolen chips, and forecasting of revenue opportunities related to specific players, dealers and promotions.

State of Play

Smart use of RFID data creates a sort of augmented reality, which has clearly demonstrated a positive effect on casino operations. Holy Grail is already in use in two California card rooms where the system is collecting data on over 100,000,000 events per month for each site. Events include individual bets, game outcomes, payouts, buy-ins, cage transactions, and count room tallies. These events can generate actionable alarms as well as detailed reports, delivering valuable data

on a range of operational activities, including security, management, HR, training, finance, and performance for specific dealers, pit bosses and cage operators. Stakeholders with proper credentials can drill down to specific events synchronized with any available security footage.



Parkwest Cordova Casino in Rancho Cordova, California

On the forefront of gaming technology, Parkwest Casinos has adopted Holy Grail at their Cordova Casino in Rancho Cordova, CA, and Lotus Casino in Sacramento. Between the two casinos, Holy Grail monitors betting action involving over 150,000 chips across 37 tables. Parkwest Casino operations have been significantly improved as a result, and subsequent dealer training has resulted in very high compliance with easy resolution for any remaining discrepancies.

The Holy Grail system, includes “smart” RFID chips and printed table felt manufactured by Abbiati Casino Equipment, and RFID reader hardware supplied by FEIG Electronics. The origin of Holy Grail began eight years ago as a collaborative effort with multiple patents controlled by Holy Grail.

Lotus	TABLES OPEN 14	TOTAL ACTION \$ 64,000	BIGGEST BETTOR 3CP 01	BUSIEST TABLE BAC 01	MOST ABORTED 3LJ 01	Jessie Smith
BC 1 Powell, Ruth 5:00 hr			Result: \$ 2,000 Action: \$ 150 Chips: \$ 21,360			3:45 hr FB (\$16,000) 2:30 hr Credit \$10,000 1:45 hr FB (\$16,000) 1:00 hr Credit \$10,000
BC 2 Smith, Jason 6:00 hr			Result: \$ (4,500) Action: \$ 2,750 Chips: \$ 9,890			3:45 hr FB (\$16,000) 2:30 hr Credit \$10,000 1:45 hr FB (\$16,000)
BC 3 Cooper, Michael 5:00 hr			Result: \$ 12,000 Action: \$ 1,250 Chips: \$ 25,860			3:45 hr FB (\$16,000) 2:30 hr Credit \$10,000
BC 4 Roberts, Hugo 7:00 hr			Result: \$ (4,500) Action: \$ 2,750 Chips: \$ 9,890			3:45 hr FB (\$16,000) 2:30 hr Credit \$10,000 1:45 hr FB (\$16,000)
BC 5 Wilson, James 5:00 hr			Result: \$ 21,000 Action: \$ 3,550 Chips: \$ 16,510			3:45 hr FB (\$16,000)
BC 6 Jones, Jane 5:00 hr			Result: \$ 12,000 Action: \$ 1,250 Chips: \$ 25,860			3:45 hr FB (\$16,000) 2:30 hr Credit \$10,000
BC 7 Clark, Nancy			Result: \$ 2,000 Action: \$ 150			3:45 hr FB (\$16,000) 2:30 hr Credit \$10,000 1:45 hr FB (\$16,000)

Dashboard for casino management to track dealer performance in real-time.

Lotus		TABLES OPEN 14	TOTAL ACTION \$ 64,000	BIGGEST BETTOR 3CP 01	BUSIEST TABLE BAC 01	MOST ABORTED 3LJ 01	Jessie Smith
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Holy Grail allows the pit boss to see in real-time key table performance metrics such as win/loss, chip inventory, biggest bettor, busiest table and total action.

The Sky's the Limit

Recent advancements in RFID tracking technology and big data analytics have culminated in a world where we can securely and accurately gather reams of data, and automate the analysis of this data to deliver all kinds of valuable intelligence. With the Holy Grail system

specifically designed for use in casinos, the resulting data set is so rich, we are only just beginning to tap into all the opportunities for improving casino operations, security and the customer experience.



As the gaming industry continues to explore the capabilities of RFID technology, we expect to see future enhancements that will allow the tracking of individual player accounts. This not only opens up even more possibilities for security and operational improvements, but also offers potential for improved customer loyalty programs. In fact, it's safe to say that when it comes to the use of RFID to maximize ROI in the gaming industry, the sky is the limit.

THANKS TO THE TREMENDOUS SUPPORT OF OUR PARTNERS:



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HOLY GRAIL TECHNOLOGIES is a new company created to commercialize unique RFID technology designed from the ground up for the gaming industry. Founded by John Park, the owner and operator of ParkWest Casinos, this technology has been tested extensively in “live” environments.

For more information, visit: holygrailgaming.com.