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Chapter 10

Artificial Intelligence: Are You Sure? Beware of What You Wish!

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Additional information is available at the end of the chapter

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Abstract

Looming in the purview of gaming leisure industry is the utmost importance of artificial intelligence (AI). Its burgeoning preponderance can be straightforwardly depicted by the following conundrum: imagine you walk through into a dazzling casino in Macau aiming to play "Baccarat." As soon as you sit down in order to initiate your gambling journey, you actually realize that the casino table dealer has been replaced by a cutting-edge robot fully equipped to enhance even further casino's house advantage (that in the realm of "Baccarat" is very narrow). What would be your immediate thought? Should you proceed with your gambling endeavors? Should you refrain yourself from initiating your gambling endeavors? Or has your self-confidence just been boosted by this unexpected challenge? Nonetheless, if you scratch deep enough, underpinning these nonrhetorical questions is a rather twisted question: what if the casino patron or high roller (player) decides himself to foster his gambling skills through AI aiming to curb or even override casino's "house advantage?" In any event, should not we take AI on the scope of gaming leisure industry very seriously in order to avoid disrepute or moral hazard of casino gaming leisure industry as a whole in light of its corporate social responsibility? This chapter will provide an overview about the current prominence of AI or simulation-based AI in gaming leisure industry, mainly for research purposes in the context of problem gambling and of forecasting online casino patron's churn behavior. Finally, this chapter will carve out the foundations of candent challenges gaming leisure industry will face in the forthcoming future about the "moral hazard" deeply enshrined in the breadth of AI, especially if robots are due to replace humans as casino table dealers in the realm of table games.

Keywords: artificial intelligence, simulation, gaming leisure industry, corporate social responsibility, moral hazard, fiduciary duties, fiduciary norms, problem gaming, responsible gaming, baccarat, poker, predicting churn behavior, Turing test, electronic gambling machines, harm minimization strategies, intelligent ambient, big data, data mining, empiric research gathered through AI-based technology

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1. Introduction

Artificial intelligence plays a pivotal role in the realm of gaming leisure industry. Its prominence stretches from the cradle of the biggest breakthroughs in gaming leisure industry (enabled by the research-based approach) to the scope of the table games. This very statement poses a sizable challenge to the gaming leisure industry altogether. The thriving of artificial intelligence in this profitable industry – namely in table games – is deeply intertwined with corporate social responsibility and with moral hazard of gaming leisure industry. More artificial intelligence in table games could bring along disrepute and opaqueness to this business activity. In the long run, artificial intelligence in table games could spark an outbreak of gambling-related crimes over the control of this cutting-edge technology, wreaking havoc in gaming leisure industry.

Future, as you may know, is not up for grabs. Even though, one does not need to have a capacious imagination to foresee that artificial intelligence is definitely a "game changer" in gambling leisure industry, as it tends to increasingly replace "human intelligence" in the ambit of "simulation" and "gaming," concretely for research purposes, but not all. Just imagine the possibility of a robot taking over the place of humans as casino table dealers in the context of table games, namely Baccarat. Inextricably linked with this anecdotal possibility, just imagine if a human (casino patron or high roller) decides to use AI to enhance his ability to thwart casino's house advantage. In these grounds, one should foresee that a "moral hazard" is intertwined with this issue. In this axiom, lies the importance of moral boundaries that ought to be swiftly set out for the sake of long-term stability of gaming leisure industry.

2. Artificial intelligence: definition

Definitions of artificial intelligence may vary according to recent textbooks. These definitions vary along two main dimensions. The ones on top are concerned with *thought processes* and *reasoning*, whereas the ones on the bottom address *behavior.* Also, other definitions measure success in terms of *human* performance, whereas another range of definitions measure success against an *ideal* concept of intelligence, which we will call **rationality**. System is rational if it does the right thing. This gives us four possible goals to pursue in **artificial intelligence** [1].

Historically, all four approaches have been followed. As one might expect, a tension exists between approaches centered around humans and approaches centered around rationality. A human-centered approach must be an empirical science, involving hypothesis and experimental.

How can one know if a robot playing the role of a human casino table dealer acts like one? One shall use the Turing test, whose feasibility has sound importance in regards of AI in table games.

The Turing test has been proposed by Alan Turing. It lies in a simple functioning criterion: how can one provide a definition of intelligent behavior? Turing carved out the definition of intelligent behavior as the ability to achieve human-level performance in all cognitive tasks,

sufficient to fool an interrogator. Turing test aims to evaluate intelligent behavior. To proficiently evaluate intelligent behavior, the computer should be interrogated by a human via a teletype, and passes the test if the interrogator cannot tell if there is a computer or a human at the other end. The framework of Turing test lies in the following and successive phases: the computer would need to possess the following capabilities: **0 natural language processing** to enable it to communicate successfully in English (or some other human language); moreover, <C> **knowledge representation** to store information provided before or during the interrogation; furthermore, <) **automated reasoning** to use the stored information to answer questions and to draw new conclusions; and another feature needed is <) **machine learning** to adapt to new circumstances and to detect and extrapolate patterns. Finally, to pass the total Turing test, the computer will need computer vision <) **computer vision** to perceive objects and robotics (> **robotics** to move them about [1].

As for gaming leisure industry, the issue of acting like a human comes up primarily when AI programs (robots) have to interact with people (casino patrons or high rollers) in a regular casino in Macau or elsewhere. To ascertain robot's intelligent behavior, Turing's test should be a reference. To pass Turing's test, robots (or AI programs) must behave according to certain normal conventions of human interaction in order to make themselves understand [1]. Again, aforementioned underlying representation should be tested in light of **Turing test** as to whether an AI robot can perform human duties such as casino table dealer and act accordingly.

2.1. Background: main importance of artificial intelligence (AI) and simulation in gaming leisure industry in present days: the empirical research related in electronic gambling machines (EGMs) and problem gambling context

The acute significance of AI speaks for itself as it not only dates back centuries as likewise depicts a perennial human aspiration to acquire transcendent intelligence (AI). The evolution of research-based approach in the realm of problem gambling portrays, in a certain way, the prominence of artificial intelligence and simulation.

Electronic gambling machines (EGMs) represent a large part of the gaming leisure industry. AI and simulation-based AI play a pivotal role for gathering empiric evidence related with EGM's and problem gambling.

EGMs are the core of gambling leisure industry, except in the casinos of Macau, where the table games, namely the *Baccarat*, heavily outweigh EGMs. Knowledge creators' focus has been driven toward the empirical evidence for the differential impact of gambling outcome on behavior in electronic gambling. Research undertaken in this specific field has achieved a major breakthrough: EGM's are the realm of addictive patterns of gambling behavior as they enhance the illusion of control of the players about the outcome of the game.

Furthermore, EGM's are markedly the domain of the loss-chasing behavior, the core characteristic of problem gambling, which can be thoroughly explained because approximately 13% of EGM gamblers meet diagnostic criteria for problem gambling (PG), which is one of the highest rates of among all other forms of gambling. EGMs can be found everywhere. They are interactive, computerized gambling platforms that operate indistinctively across this boundless

and globalized data-driven world. Licensed betting offices, casinos, and other leisure facilities, of course, are no exception.

What is the role of EGMs as for bolstering problem gambling? What is more, do EGMs enhance player's illusion of control as for the outcome of game or bet? EGMs reinforce addictive patterns of gambling behavior. It is really an empiric axiom: EGMs have been shown to instill and maintain irrational and superstitious beliefs, as well as distort concepts of randomness and probability that can contribute to illusions of control. Such features may act to maintain or indeed contribute to the onset of PG behaviors.

This empiric axiom (EGMs contribute to instill and maintain addictive patterns of gambling behavior) is inextricably linked with sizable prize sizes: EGMs offer high maximum stake and prize sizes and the fact that accessibility of EGMs are abundant on the high street brings along another simmering danger: even inexperienced and leisure gamblers are at risk of increased rate and volume of loss, irrespective of whether they would be classed as PG or not. A rapid speed of play provided by EGMs offers fewer opportunities between bets to break trancelike dissociative states gamblers experience, as well as less time to consider one's decisions in an informed and controlled manner.

Furthermore, EGM play also allows for a high rate and volume of loss, which is allowed to further exacerbate if one engages in *loss-chasing behavior* – as stated above, a core characteristic of PG. Loss chasing may not however, be limited to PGs, and there is a potential for the fast-paced characteristic of EGM play to negatively impact on [2].

In this regard, a recent research (simulation) has investigated how these EGM characteristics interact with winning and losing outcomes and the resulting gambling behavior, as there is wide body of evidence outside of gambling research that suggests gains and losses have an asymmetrical impact on affect and arousal, as well as cognitive capacity and decision making – essential components to be controlled and rational gambling decisions [2].

Conversely, losses compared to wins, have a larger effect on physiological arousal. Hochman and Yechiam reported significantly larger pupil diameter and increased heart beat in response to losses compared to equivalent-sized wins [2].

AI research-based approach has had a pivotal role as for ascertaining that losses lead to a greater increase in psychological arousal, this may result in the gambler's optimal level of arousal being surpassed, which may be detrimental to rational decision making and lead to a loss of control during gambling, where the fast-paced and high stakes features of EGM play may exacerbate the harm caused by a loss of control [2].

Having this body of evidence very firmly in mind, it is very important to implement strategies that enable a gambler to remain in control during the gambling session so that gambling-related decisions are made in a rational manner. The implementation of that assortment of measures embodies the deemed harm minimization strategies that have been put in motion pursuant empiric evidence gathered through computerized simulation (and AI). In this axiom lies the uttermost relevance of simulation-based AI as this body of evidence would never surface in gaming leisure industry's horizon if it were not its invaluable contribution.

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2.2. Background: the importance of artificial intelligence and simulation in the scope of gambling leisure industry: empirical evidence in the context of electronic gambling machines (EGMs) and the harm minimization strategies: the pop-up messages and the personalized feedback

If wins and losses do indeed result in an asymmetrical impact on a gambler's behavior during EGM gambling, it is important to implement harm minimization strategies in a timely manner before harmful behavior augment or escalate.

Nonetheless, prior to the implementation of any harm minimization strategies whatsoever, there is a major paradigm shift yet to be undertaken: the problem gambling should be approached in a proactive manner rather than a purely reactive one.

That very statement emphasizes the major importance of AI or simulation-based AI in the context of problem gambling in present days, as the bulk of empirical evidence gathered contributes for the creation of healthy gambling environments, in a timely manner.

A striking example of this is the research conducted into cognitive psychology of gambling. This simulation-based AI has shown that irrational gambling-related cognitions and misunderstandings linked to randomness and probabilities represent some of the key components contributing to the initiation and maintenance of problematic gambling in general, and in electronic gambling in particular [3, 4]. Furthermore, it has been shown that problematic gambling behavior can be curtailed pursuant to cognitive-behavioral therapy and similar cognitive interventions gathered through simulation-based AI. As a consequence, some organizations and gaming operators are beginning to offer players information about common gambling myths and erroneous beliefs. Furthermore, players can now access general advice on healthy and responsible gambling [3, 4].

A small body of empirical research gathered through simulation-based AI has shown that educational programs about erroneous beliefs can successfully help change the targeted cognitions. Take the example of the simulation-based AI conducted by Wohl et al. He has developed an animation-based educational video regarding the function of slot machines, their results depicted that the animation was indeed effective in promoting responsible gaming as demonstrated by those viewing the video staying within their pre-set limits. The aforementioned survey also demonstrated that animated educational information on slot machines (EGMs) can be an effective to enhance user adherence to pre-set limits [3, 4].

Simulations based on AI have also shown that the way the information is presented is significant. Several studies and simulations based on AI have investigated the effects of interactive pop-up messages during gambling sessions. Static messages do not appear to be as effective, whereas interactive pop-up messages and animated information can change both irrational beliefs and behavior [3, 4]. Stewart and Wohl reported that participants (in simulation-based AI) who received a monetary limit pop-up reminder were significantly more likely to adhere to monetary limits than participants who did not [3, 4].

Increasingly arising on the horizon of the gambling field is the personalized feedback, developed for responsible gambling purposes through simulation-based AI.

Personalized feedback is a behavioral tracking tool, for responsible gambling purposes. There are several programs that constitute a striking example of it, such as *Playscan*, *Mentor*, *Bet Buddy*.

Scholars emphasize that players receiving tailored feedback about their online gambling behavior are more likely to change their gambling behavior (as measured by the amount of time and money spent) compared to those who do not receive a tailored feedback [3, 4].

A recent simulation-based AI analyzed the behavioral change in vast array online gamblers (279, to be accurate) that received personalized feedback after they had signed up to a voluntary service (i.e., mentor or any other responsible gaming feature) at a European online gaming website. Those signing up to use the personalized feedback system were compared with 65, 423 have managed to match controls. The precursory results of that study demonstrated that personalized behavioral feedback within a motivational framework appears to be both an effective and accurate path of changing gambling behavior in a positive way (i.e., players notably curbed the amount of time and/or money they spent gambling after receiving personalized feedback). For example, if a player remarkably augments the amount of money they have deposited over a certain time frame (for instance, half year time period), they received the following message: "Over the last 6 months the amount of money deposited into your account has increased. Are you spending more money than you intended? You can check the amount you have spent gambling on your account page and use our helpful tools to set a daily/weekly/monthly limit" [3, 4].

Overall, the personalization approaches carved out above intend to overhaul a person's behavior through behavioral feedback. Such approaches are supported on both the "Stages of Change" model and motivational interviewing. He et al. specifically emphasized the importance of tailored information. They have managed to synthesized a vast array of motivational psychology literature to develop a motivational framework based on the transtheoretical (i.e., states of behavior change), which asserts that individuals making efforts to overhaul their behavior in a certain way experience a series of stages (i.e., pre-contemplation, contemplation, preparation, action, maintenance, and relapse). For each stage, they asserted the motivational aim (s) and recommendation (s) as to how technologies (simulation-based AI, to be precise) can boost sustainable energy usage behaviors by people [3, 4].

In sum, behavioral feedback systems enable an optimistic approach of responsible gambling, as they achieve the targeted goal of helping the players sensibly limit the amount of time and money spent gambling.

Again, that could never be achieved without the inestimable guidance of simulation-based AI that has enabled all stakeholders of gaming leisure industry to be cognizant of exciting pieces of research gathered through empiric evidence.

2.3. Background: the importance of artificial intelligence and simulation in the scope of gaming leisure industry: empirical evidence to predict *online casino patron's churn behavior*

Both in professional and everyday life, people have to interact with and reason about a large number of computerized systems. Artificial intelligence (AI) based on computer simulations

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can be used to construct interactive environments by means of which people can develop knowledge about the behavior of these systems. The steadfast increase in computing power has in fact given simulation a solid position within the area of gaming leisure industry. However, quite a few studies have shown that simulation-based AI is only effective when proper and sound guidance is duly provided. Automating certain tutoring and training functions aiming to provide such guidance requires the simulation-based AI model to be *articulate* and fully functional. Two other requirements follow from this. Firstly, a given simulation model ought to portray all the behavioral features of the 'real' system as far as those are important to the educational objectives. Secondly, a simulation model must have the appropriate *handles*, by means of which these features are indexed, to enable a knowledgeable communication with the learner about the model contents. Qualitative and reliable simulators, such as QPE and GARP, provide a ground for generating articulate simulation models [5]. They are crucially important in gaming leisure industry.

Empirical evidence gathered purposefully to predict online casino patron's churn behavior constitutes a striking example of prominence of artificial intelligence (AI) based on computer simulations.

Recent research has focused on customer retention in the online gaming industry by predicting player churn propensity (the likelihood to leave or stop playing at an online casino) at the individual player level. More specifically, that empirical research examined whether a **data mining algorithm** can be an effective method to predict customer churn based on online players' historical and tracked gaming data. Furthermore, it identifies the important churn predictors and predicts online players' churn behavior by incorporating an individual player's visitation and play pattern in the churn prediction model. The methodological approach advanced herein introduces a data-drive method to predict which customers are likely to churn based on individual player's gaming and demographic data. The application of this approach can help casino managers identify potential churners more precisely at the earliest possible point and eventually develop more targeted retention programs geared toward the customers at high risk of churn. This in turn will not only help them proactively prevent customer attrition but also optimize their marketing campaign and spend based on insights gained by analyzing customer behavioral data. Furthermore, the targeted retention strategy will help casino managers lower their direct marketing costs and save substantial amount of marketing dollars [6].

In the prediction of customer churn behavior, researchers have employed various **data mining algorithms**. In the gaming literature, decision tree algorithms were employed in several studies. Braverman et al. applied Chi-squared Automatic Interaction Detector (CHAID) to individual players' transaction data at an online betting website to identify high-risk players. Coussement and De Bock and Suh and Alhaery also utilized decision tree approach, classification and regression trees (CART) and exhaustive CHAID (E-CHAID), respectively, to predict player attrition behavior. Decision tree analysis methods are best known for mining large data sets. A decision tree divides any given population into subgroups based on the strongest predictors that provide the greatest degree of separation of one group from another in relation to the target variable. Additionally, **gaming data** is rather skewed with a large concentration of players having very little play [6].

Overall, the application of the predictive churn model advanced by these renowned researchers can help casino managers identify potential churners before they churn. Once the potential churners are identified, a more effective retention program and targeted marketing messages can be created and deployed to intervene and prevent customer attrition. If a customer appears to have churned, casino managers can prioritize their reactivation efforts according to the customer's churn propensity scores. Those customers with low propensity scores could be relatively easy to convert into active players in comparison to those with high churn propensity scores. It may not be worth spending the time and marketing dollars to convert some of the players with high churn propensity scores and low gaming values to the casino [6].

In these grounds lies the importance of simulation-based AI that keeps gaming leisure industry abreast with the newest developments of empiric research aimed to accelerate the benefits of global innovation.

2.4. The importance of *artificial intelligence* (*AI*) and its brotherhood with *intelligent ambient* (*IAm*) in gaming leisure industry

Evidence presented throughout this chapter is overwhelming: AI is everywhere. It spans through every aspects of our daily life, even tiny and apparently insignificant ones. As for gaming leisure industry, one cannot forsake or disregard the utmost importance of *intelligent ambient* (*IAm*), which is closely linked to the very concept of *artificial intelligence* (*AI*). Both concepts are deeply intertwined with privacy issues (*big data*) of casino patrons. Currently, this is a major concern to the gaming leisure industry as a whole.

The concept of *intelligent ambient* or *IAm* [7] (From the English *ambient intelligence*) [8–10] represents a digital and pervasive ambient created by the convergence of the technologies of radio transmission and broadcasting (as an identification by radiofrequency (*RFID*)) [11], agents of software, sensor networks, processing of data by personal mobile devices, which provides, in cyberspace, the integration and the interaction of the devices named as "*intelligent*" [12]. This new reality in gaming leisure industry depicts an *ambient* (*intelligent*) in which the casino patrons or high rollers are surrounded by intuitive interfaces embedded in every corner (even the most uncongenial and unexpected ones) of the casino [13].

Conversely, casinos have a remarkable apparatus of objects (enshrining the taxonomy of digital ambient) embodying one capacity of analysis of context and of adjustment (standardization) to the needs of the casino patrons and high rollers of the casinos [14, 15].

Those intuitive interfaces capture, collect and store, in real time, the high rollers personal data (or quite simply gamblers). Those intuitive interfaces ultimately intend to shape and standardize their real necessities, habits, and attitudes. Therefore, those intuitive interfaces allow casinos to maximize and optimize the intelligent ambient in which those intuitive interfaces were primarily created. This is only achievable due to AI proficiency and accuracy that precedes *IAm*.

Having that specific goal in mind, systems of *IAm* of the casinos have to collect and process large amounts of *personal data* and outline (or carve out) the casino patrons or high rollers profiles. These personal data are commonly collected and processed without any notification of the casino patrons or high rollers [16] through devices and techniques, which carry out a

silent and continuous tracking of players' private habits [17, 18], violating, at least in theory, one of its primary requirements – the indispensable existence of consent of the holder of the personal data [12, 19]: the casino patron or high roller.

In the realm of intelligent ambient of the casinos (or overachingly, gaming leisure industry), systems of surveillance (constituted by *artificial intelligence* and *ambient intelligent*) entails the risk of an undue processing unsolicited of personal data of casino patrons or high rollers [12, 20, 21].

The aforementioned brings along an imperilment: in the cases of use of personal data for spurious purposes (*e.g.*, blackmail), there is an unreachable core of casino patron's privacy that is violated: the *thematic privacy* and *spatial privacy* of the casino patrons.

What is *thematic privacy* and *spatial privacy*? According to the German Constitutional Court (*Bundesverfassungsgericht – BVerfGE*), one can define the thematic privacy by universe of factual constellations covered by *privacy in a material sense*, refers to those personal data or realities that the holder (casino patron or high roller) of the fundamental right intend to subtract to the curiosity and to the public discussions, such as sexuality, deviant behaviors, and diseases.

This approach brings up the first caveat regarding *AI* and *IAm*: cutting-edge technology is a great leap forward for gaming leisure industry but moral boundaries should be set out, especially when it comes to handle adroitly the risk of an undue processing and unsolicited of personal data of casino patrons.

One can outrightly foresee the grounds for these enmeshed concerns: there is an *unreachable core of privacy* that is deeply intertwined with universe of personal data of the casino patrons or high rollers that involves, and identifies with – the universe of things, facts, events, experiences, emotions, places, meaning that they are a core of irreducible subjectivity, individuality, and personhood the casino patron or high roller understandably intends to keep to himself and for a scarce number of "others"; therefore being that a *space of guardianship of privacy,* converted into a place of fulfillment of private life of casino patrons or high rollers (thus, unreachable core of thematic privacy and spatial privacy, we have been referring to throughout this chapter) [22, 23].

In this light, the use of personal data of casino patrons or high rollers for strange purposes (e.g., blackmail) to the services trade and of functionalities given by the casinos comprises a "*big profligate*" (*grosser Lauschangriff*) [24, 25]. In sum, mischievous use of casino patron's personal data for purposes other than casino functionalities or marketing should be fiercely forbidden. In these grounds, one can foresee the moral boundaries that we have been insistently referring to throughout this chapter. Moral boundaries regarding this specific topic (apposite use of casino patron's personal data) are to be set out or reputational damages may occur in the realm of gaming leisure industry.

2.5. Discussion: *artificial intelligence* (*AI*) and gaming: what lies ahead?

I came across AI a few years ago through insightful thoughts of Stefen J. Karoul that reportedly was working with a group of scientists who have developed a very effective new AI model for Poker. Back then, he told me that AI opens up many creative new thoughts and opportunities going in different directions ranging from educational to just learning how to become a better

Poker player or a more skilled gambler. He wondered how long it will be before they begin to focus on other casino games such as Baccarat, Blackjack, or Roulette? That will in effect change the face of legal casino gaming again. How will gaming management react to AI? Will it be viewed in the same vein as card counting? How will surveillance detect and monitor AI on the casino floor? However, most importantly, how will players or consumers react to AI? Will they view it as something positive and try to learn more about it, how it works, the benefits, and or the risks? Or will players view AI as something negative that will now put them in an unfair position when they visit legal casinos both land-based and online to gamble? Will they think that casinos can afford to develop and exploit AI to help guarantee that they will win more money from players? What else will change in the future that will impact casinos as we know them today?

The aforementioned array of remarkable thoughts poses a far more intriguing question: will gaming leisure industry ever be the same when (and if) robots or AI-computerized humans replace casino table dealers in table games, such as Baccarat?

Gaming leisure industry landscape ought to be drastically overhauled if that replacement is to be undertaken. Foundations of our concerns can be summarized as follows: firstly, if robots or AI-computerized robots who can perform human tasks according to the **Turing test** (see point 2) are to replace casino table dealers most likely ought to deepen imbalance between casinos and players as for house advantage in table games; secondly, AI will give rise to "black market commercial trades" regarding the purchase and sale of AI cutting-edge technology, as common sense dictates everyone will feel confident enough as for tentatively embarking in a winning streak that allegedly will bring casinos "to its knees" – it is an assertion that rests upon on an exquisite alignment between common sense and cavernous knowledge about human nature; thirdly and inherently, surreptitious trades related with AI will grow exponentially giving rise to "system-sided disputes" between criminal factions over the control of AI businesses-related; fourthly, AI ought to enhance player's erroneous beliefs that house advantage can be outright overturned through an "artificial intelligence" at arm's length; fifthly, being AI at player's arm's length will reinforce distortions about the so-called illusion of control of players about the outcome of game or bet, bringing back "old phantoms" that science-based approach is so keenly and effortlessly tearing apart; sixthly, an atmosphere of unbearable suspicion will overshadow gaming leisure industry as whole, as antagonism between players and casinos over the control of outcomes of table games will dramatically rise; seventhly, an outbreak of "cheating sprees" will surely be a murky reality in gaming leisure industry, as players and casinos will effortlessly try to quash each other's odds, regardless if that is to be achieved in a honest way; eighthly, gloomy as it seems, AI ought to cause massive labor contract terminations, as human casino table dealers will be no longer needed in table games; ninthly, AI in the realm of table games will surely thwart the effectiveness of deemed *corporate social responsibility* of gaming leisure industry as casinos and player's will spare no efforts to maximize their winning streaks, regardless of putative and harmful side-effects; tenthly, AI at arm's length to casino patrons or high rollers ought to be a "nightmare" for casino's surveillance as IAm underpinning surveillance systems is absolutely clueless of whether a casino patron or high roller is using AI cutting-edge technology to enhance his gambling skills or the casino patron or high roller is just a very skilled player who happens to

be in a "skill-based winning streak" – this uncertainty entails suspicion in gaming leisure industry that is not to be welcomed.

In this chapter's abstract, a hazy gaming leisure scenario has been depicted in the event of replacement of casino table dealers by robots or AI-computerized robots that can perform human tasks according to the **Turing test.** Those concerns are to be maintained, if not heightened, should moral boundaries are forsaken in this specific topic. Aiming to carve out those moral boundaries that ought to refrain everyone's appetite for AI (at least in regards of replacing casino table dealers in table games, such as Baccarat), this chapter will lay the foundations for those moral limits that ought to pervade gaming leisure industry as whole.

2.6. Discussion: *artificial intelligence* (*AI*) and gaming: corporate social responsibility of gaming leisure industry is not a chimera and should be taken seriously or reputational damages may otherwise occur: beware of what you wish!

Moral boundaries regarding AI are to be set out for the sake of the long-term stability of gaming leisure. This very statement does not jeopardize the cardinal importance of AI and simulation in the context of empiric research, but quite the opposite, as abundantly shown in **Sections 2.1.–2.5.**, AI and simulation play a pivotal role as for shedding light about the relevance of a much-needed science-based approach in gaming leisure industry. Problem gambling is a fine example of the overruling importance of AI and simulation for research purposes. Having this assertion very firmly in mind, AI and simulation role in gaming leisure industry should not be tarnished by spurious intentions of replacing the **human element** (casino table dealer in table games) that ensure experience in a casino as fun for all. Can you imagine playing against a robot that would outright quash your gambling skills in table games (namely in Baccarat)? What's the fun in that after all? Apart from that, will not such a replacement comprise a professed whim to blowing casino's corporate social responsibility to pieces? I avowedly emphasize that such a replacement is the very obliteration of corporate social responsibility that is deeply embedded in casino's activities, and overarchingly, gaming leisure industry.

Fiduciary duties and especially corporate social responsibility of gaming leisure industry are not a grotesque product of imagination. They actually exist. If they are to be disregarded by the very guardian that ought to hold them dear (casinos) reputational damages may occur. Conversely, moral hazard of gaming leisure industry shall not fall far behind.

How can one outline corporate social responsibility (CSR) [26–28]? CSR has been a trendy issue for many years now. Corporate social responsibility sprout (or quite simply, germinate) of the community's and social groups' expectations [29] that enterprises should not only care about short-term profits. Instead, enterprises must take appropriate actions to foster the well-being of the community in which they operate and make business with. Because most companies operate within the boundaries of human communities, they should also have social responsibilities that they are duty-bound or even compelled to fulfill [30, 31] – to make the world a worthier place to live in. Enterprises should perpend the impacts of their business activities on all stakeholders including their customers (casino patrons or high rollers), trade partners, employees, investors, and community at large. Needless to say, a vast array of

enterprises view CSR as a way of surrender some prosperity to the community in which gaming leisure operates. Oftentimes, corporate social responsibility is ordinarily viewed as public relations. However, these conventional and long-established views of CSR are too narrowly outlined. While there is diffuse adoption of the concept due to societal pressure, many enterprises and people still erroneously lucubrate that CSR does not make good business sense. The fact is: CSR encompass much more than just the mere meaning of good business – it can be an apposite path to achieve a sustainable competitive advantage [32] for gaming leisure industry [33]. A long-term imperishable competitive advantage (to be accurate: business sustainability) of the gaming leisure industry. To be clear-cut: a long-term stability of the gaming leisure industry in the forthcoming future. In this light, corporate social responsibility is inextricably linked not only to business sustainability but likewise with long-term stability of the gaming leisure industry in the forthcoming future.

Finding a balance between corporate resources, profit objectives, and social expectations is a key factor in CSR concept [34]. It is not just about social responsibility; it is about socially integrating the operator's values with societal values [35] – a delicate balance of values. Operators must realize that in operating a casino in Macau or elsewhere, they should find common values between themselves and the society.

These values become essential for business sustainability [36] – again, the aforementioned positive play and the creation of a healthy gambling environment, which means that gaming industry's efforts to curb AI in table games should not be spared. Social responsibility of casino industry encompasses the economic, legal, ethical, and discretionary expectations that society has of organizations at a given point in time [37–39]. The CSR firm, for instance gaming industry, should strive to make a profit, obey the law, be ethical, and be a good corporate citizen [40].

Should gaming leisure industry fails to comply with their corporate social responsibility by replacing the human element (casino table dealer in table games such as Baccarat) aiming to boost house advantage, reputational damages may occur. What does reputational damage mean?

It means damages to the social image of the gaming leisure industry [41, 42] – these are "indirect patrimonial damages" [43, 44], as its occurrence may cause an effective downturn on casino's revenues.

Reference to the indirect patrimonial damages means also reputational damages [45] of gaming industry [46] essentially relates to their reputation [47] – a precious asset when it comes to a long-term business sustainability. In these grounds, one can find plausibility of corporate social responsibility (CSR) [48] of gaming leisure that, if obliterated, might just give rise to a turmoil. Furthermore, ought to create "moral hazard" for gaming leisure industry.

In this scope, take the example of Canada. It is assertable that Ontario, *Ontario Lottery, and Gaming Corporation* (*OLGC*), and gaming leisure industry are bound to a positive *duty of care* to aid the problem gambler in given circumstances. It is an axiom that casinos have a wide range of *electronic and intelligent tools* with which to monitor the gambling habits and losses of their casino patrons or high rollers (enabled by the aforementioned tandem between *artificial*

intelligence, *ambient intelligence,* and *surveillance* that allows casinos to proficiently track gambler's addictive patterns arisen from problem gambling). In this regard, it has been asserted that gaming leisure industry is bound to a general duty to operate in "the public interest and in accordance with the principles of honesty and integrity". Lastly, casinos and problem gamblers are bound to a contractual relationship in which, like the *tavern keeper*, the casino has an "abnormal" inducement to heighten gambling activity and casino patron's losses; in this scope, on 26-10-2006, the decision of Madam Justice Sachs in *Edmonds v. Laplante*, following the *legal reasoning* stated in *Cooper v. Hobart*, asserted that, according to *Anns test*, the *Ontario Lottery and Gaming Corporation* (*OLGC*) owe a *duty of care* to assist the problem gamblers [48]. In this light, one should foresee the utmost importance of corporate social responsibility in gaming leisure industry.

2.7. Discussion: *artificial intelligence* (*AI*) and gaming: gaming leisure industry ought to uphold/comply with fiduciary norms or bear the costs of "*moral hazard*"

AI architecture in gaming leisure industry has already been put in motion. One can straightforwardly confirm that in the ambit of Poker. AI and Poker make an exquisite alignment (or shall we say combination?) but it is also to some extent a new testing ground for intricate AI research. While producing computer agents that are apposite and prone (thus, able) to play poker, scientists face many appealing and perplexing problems, which need to be thoughtfully addressed and tested. One Russian software company has created a vast number of new artificial intelligences to play poker at a professional level. The Poker games include both *No Limit Texas Holdem* (2–10 players) and *Fixed Limit Texas Holdem* (2–10 players). This concrete Russian company now promotes that they have developed professional level AI poker players or Bots (robots) and that this uncommon know how can now be used in a cutting-edge training system. Presently, their lab is working on a new poker training service, which will enable people (regular casino patrons) to enhance their poker skills with visually demonstrated deviation from optimal play along with recommended strategy adjustments in real time. They have further asserted that this is not only a standalone product but a product that could also be seamlessly integrated into any gambling portal or online poker room. With further detailed research one can also find an American software company offering a wide range of professionally produced tutorials that are also partially based upon AI to help train members to become sharpened poker players. They have produced over 200 educational videos ranging in skill level from beginner to intermediate to advanced [49].

It is now crystal-clear that an unrelenting drive to excellence, aiming to bolster player's skills in Poker, has already begun. An immediate question emerges: how long until this drive broadens its horizons to Baccarat or any other table games? Should not this unanticipated spree or race to capitalize benefits of cutting-edge technology such as AI be as equivalent as opening a Pandora Box in gaming leisure industry? Our assessment on this is adamant and very clear: should gaming leisure industry fail to take this issue seriously and accordingly take appropriate actions to prevent proliferation of AI in table games its moral hazard might surface as an outbreak of gambling-related criminality will darken this lucrative industry. Gaming leisure industry ought to step up and lead the way against proliferation of AI in table games. In order to achieve that gaming leisure industry ought to uphold fiduciary norms that are deeply ingrained in its corporate social responsibility.

Gaming leisure industry ought to abide to fiduciary norms deeply intertwined with their corporate social responsibility. Fiduciary norms are apposite to gaming leisure industry as its three main features bear striking resemblance with norms of contract, tort, and criminal law that are intrinsically connected with gaming leisure industry activity as a whole. Fiduciary norms are sharply linked to corporate social responsibility as gaming leisure industry ought to drive its focus to do no harm to the social community in which operates. One can forthrightly understand the grounds for this linkage. First, fiduciary norms impose deliberative requirements: they make specific types of demands on an agent's deliberation in addition to her behavior. Second, complying with fiduciary norms requires a special conscientiousness, a corporate social responsibility consciousness. Living up to a fiduciary obligation depends not only on how gaming leisure industry behaves and deliberates, but also on whether she does so for the right reasons such as performing adroitly their corporate social responsibility for the sake of the long-term stability of gaming leisure industry. Third, fiduciary norms impose "robust" demands, which require the fiduciary to seek out and respond appropriately to new information about the interests of her beneficiaries (the whole community in which gaming leisure operates). As a result, our thesis is that fiduciary principles can be fruitfully applied to many domains of public law such as gaming law. A note in our use of the terms "fiduciary norms" and "fiduciary principles": according to a definition of norms that we find appealing, every norm has both a normative element (that is, it is constituted by "normative principles") and a *socio-empirical element* (in that it operates over and is "somehow *accepted* in" the particular domain over which it applies) [50]. On our usage, fiduciary norms are constituted by fiduciary principles (which are usually, but not necessarily, stated in the form of requirements applicable to the fiduciary) that operate over and are accepted within the domains (generally those in private law) over which fiduciary laws apply [51]. Thus, fiduciary duties are established and entailed by fiduciary norms and principles [52–57, 59].

Failing to perform adroitly those fiduciary duties (that enshrines fiduciary norms and principles, as seen above), and foremost, its corporate social responsibility, as for preventing proliferation of AI in table games, originates gaming leisure industry's moral hazard.

Moral hazard in the realm of gaming leisure industry lies in a simple question: what obligations do gaming leisure gaming have to perform in order to prevent or alleviate the suffering of others or to eschew disrepute to this lucrative business altogether?

When it comes to corporate social responsibility, the concept of "moral hazard" is one of the most prominent, and least well understood, of the cogent tools applied to these and other social responsibility questions. Whether the issue is related to products liability law, workers' compensation, welfare, health care, banking regulation, bankruptcy law, takings law, or business law, moral hazard is a cardinal part of the law. From a law and economics standpoint, moral hazard sheds light about how things are and came to be as they are. Moral hazard is punctiliously related with moral boundaries that ingrain corporate social responsibility. The tandem between corporate social responsibility and moral hazard explains why moral boundaries ought to be outlined in the ambit of AI in table games: the long-term sustainability and stability of gaming leisure industry depends on whether this lucrative industry abides to its fiduciary duties to curb AI in table games.

The best way to portray the ubiquity of the moral hazard lens on corporate social responsibility in gaming leisure industry is to quote a well-known writer that described the "lesson of moral hazard" as follows: what moral hazard means is that, if you cushion the consequences of bad behavior, then you encourage that bad behavior [58].

Moral hazard encompasses a simple lesson: less is more. As for gaming leisure industry, less AI in table games is definitively more corporate social responsibility and a bullet-proof hope in the long-term stability of this profitable industry. Should AI door be wide open to table games, requirements for a perfect storm are met and gaming leisure industry might not be able to bounce back from its sequels.

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