



What's in a Game?

Better Health Outcomes

Gamification techniques are solving some of healthcare's most serious problems.

Every year, one in four American adults suffers from a diagnosable mental disorder, yet most of them go untreated because the majority of primary-care providers have received little training about mental health risk factors, symptoms, and treatment options. Although primary care providers are generally the first point of contact within the healthcare system, they still receive little training about mental health risk factors, symptoms, and treatment options.

Enter Kognito Interactive and its training game, designed to help PCPs engage with their patients' behavioral health. The game engages physicians in a series of clinical encounters and conversations with emotionally responsive virtual patients so doctors can practice in a safe and realistic environment and learn better techniques to discuss mental health and motivate patients to adhere to the treatment plan.

A study of the results showed that playing the game significantly increased PCPs' skill and motivation to screen patients, to conduct behavioral interventions, and to refer patients to specialized care.

Helping children living with cancer to better navigate their world was another healthcare issue solved with a game. Children and young teens battling cancer find it difficult to remain compliant with their therapies, to know all they need to know about their cancer, and to continually be mindful of taking care of themselves.

In 2006, HopeLab developed Re-Mission — and this year launched a new version called Re-Mission 2: Nanobots Revenge — to help kids with the monumental challenges of living

with cancer. Players of the video game assume a virtual human body that is equipped with weapons, such as chemotherapy and antibiotics, to fight cancer. During a clinical trial of 375 young cancer patients who played the game for three months, 16% of them had a higher usage of antibiotics and all of them, on average, maintained 41% higher blood levels of chemotherapy.

In another example, physicians and staff at a British hospital — Glenfield Hospital in Leicester — were not effectively using asthma guidelines in the treatment of emergency asthma patients who presented at the hospital. One young physician was able to dramatically improve asthma emergency care at the hospital by creating a fun music video with song lyrics regarding new asthma guidelines. According to NPR and other news sources, before the video, less than half of the doctors at the hospital made use of asthma treatment guidelines and one-third didn't even know the asthma guidelines existed. Respiratory specialist Tapas Mukherjee and some colleagues created the homemade YouTube video with their smartphones and passed it around to the staff. Two months after the video was released, a second audit revealed that all of the hospital's doctors knew the asthma guidelines and 80% said they were using them. Dr. Mukherjee and his video won the British Thoracic Society Innovation in Education Award in 2012. (Editor's note: To view the video, go to youtube.com/watch?v=qj0PEn79Cuw.)

These are just a few of the many successful gamification techniques being used in healthcare management today. The practice of using game thinking and game mechanics is not new

in other industries, and is just gathering traction in a healthcare context. The recent uptake in the healthcare space is being driven by several factors, most significantly the ubiquitous use of smartphones. The mobility and always-on nature of smartphones and tablets have created the perfect platforms for participating in games that improve health — both from the patient and physician perspectives. (For more information on how mobile is driving the gamification trend in healthcare, see our bonus digital edition.) Other factors, according to a recent report by consulting firm ICF International, include the trend toward value-based care, the increasing role of the patient as consumer, and the millennial generation.

Studies show that education and training are more effective when they involve hands-on practice and personalized feedback, says Ron Goldman, CEO of Kognito Interactive.

"Integrating game mechanics into a learning experience can help achieve that," he says. "If we allow physicians to practice in a risk-free environment, try different approaches, and experience their consequences, we can not only better engage them but also allow them to master the skill faster than they would otherwise and, therefore, provide them with a concise yet highly valuable learning experience.

"When people are engaged and learn through practice such as in a game, they are learning faster and retaining skills better," he continues. "Studies show that a practice-based learning experience results in significantly higher rates of knowledge retention and skill building."

Through her research, Sarah Ray, research analyst at Cutting Edge Information, has



“ Sanofi UK takes an agile and flexible approach when deploying digital initiatives, striving to adapt the solutions quickly in response to real-time customer feedback.”

ANDREW BROWNING
Sanofi UK & Ireland



“ Gamification is an enormously important development in the future of healthcare. ”

MICHAEL FERGUSSON
Ayogo Health

found that simulation tools are very valuable to physicians, because they can practice and role play in a safe environment, and when the physicians come across similar situations in their practice, they are better equipped to respond.

“Simulation tools have value because they let physicians experience how to respond and anticipate future treatment with actual patients,” she says.

If It's Not Fun, It's No Game

It doesn't take rocket science to know that people will only play a game if it's fun.

According to Leonard Kish, principal and co-founder of VivaPhi, gamification needs to transform something that is not fun, like testing glucose levels, and turn it into something that is entertaining and enjoyable.

“A game is something that is done for pleasure, and gamification is when we turn some kind of process or activity that is done for a reason other than entertainment into a game,” Mr. Kish says.

Michael Fergusson, CEO of Ayogo, says

this is the key to successful gamification in healthcare. It is more complicated than taking an activity that is not enjoyable and adding badges or scores as a reward.

“The process of gamification has little to do with points or badges; these are to games what chapter headings are to literature. The true process of gamification is taking an activity somebody does not want to do, something that on its own is considered a chore, and re-contextualizing it within something larger that they will enjoy doing.”

For example, Mr. Kish cites Fred Trotter, author of “Hacking Healthcare,” who describes golf as the gamification of a walk, and soccer as the gamification of running.

“Playing a game feeds on our core motivations of personal challenge and our competitive nature,” Mr. Kish says. “And that's really what gamification is about, harnessing our core motivations and drives.”

The phrase “no pain-no gain” does not apply to games. Mr. Fergusson says one of the most important aspects of motivating people is to make the process entertaining.

“We know that it's easier to engage with things that we enjoy more than the things that we don't, but to our detriment, and to the detriment of our patients, we continue to make healthcare obligations a chore,” he says.

“You cannot bore people into behavior

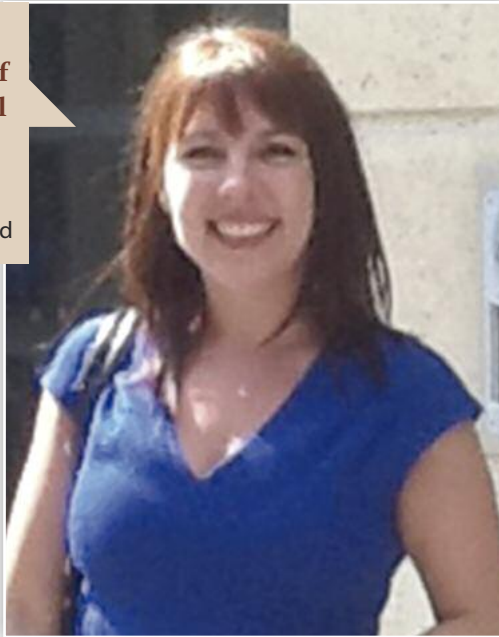
Gamification Elements Necessary for Successful Game Design

- » **Compelling Narrative:** People want to get immersed in the story; in medicine, that could be their own story.
- » **Progressive Mastery:** The ability to consistently get better at challenges within the game without becoming frustrated.
- » **Social Element:** Games are, at their core, social activities.
- » **Intermittent Rewards:** Players will check back on a game when they aren't sure when rewards might be coming.
- » **Giving:** Farmville is compelling because it allows people to give items to each other.
- » **Knowing What To Do Next:** People will naturally avoid confusion, so give players something to do that they know they can accomplish.

Source: Leonard Kish, principal, co-founder, VivaPhi Inc. For more information, visit vivaphi.com.

“ At Sanofi we are convinced that games do work in terms of influencing positive behavioral change and that they are not unsafe for patients. ”

REBECCA REEVE / Sanofi UK & Ireland



change,” says Dan Chichester, chief digital officer at Ogilvy Healthworld, part of Ogilvy CommonHealth Worldwide. “But the game has to be more than fun, it needs to have a foundation of a more meaningful, compelling experience. At its heart, a game is based on the premise that every action taken feeds back data, telling whether the decision was good or bad — and then providing insight into the next best step. The player — or learner — can then apply that knowledge in context. Building on that, understanding what the target finds interesting is core to making the game actually fun and, therefore, engaging enough to drive the player to acquire further achievement.”

Gamifying Elements Necessary to Win

Along with being fun, there are several other crucial elements that need to be present in the gamification of healthcare solutions. From a game designer’s point of view, the most important is having a full understanding of the target audience that will be participating in the game, and that is more difficult when dealing with patients who are suffering from chronic diseases.

According to Andrew Browning, digital



“ The industry is in the beginning stages of incorporating game theory and design to healthcare delivery and clinical practice. ”

MIKE MARETT / WorldOne Interactive @mikemarett

lead at Sanofi UK & Ireland, understanding the patient’s current issues with the condition is critical, as is identifying a genuine patient need that is not met elsewhere. Mr. Browning recently worked with Ayogo Health to design a game for children in the UK with type 1 diabetes, to create a more fun and stress-free way to test their blood glucose levels. *Monster Manor* is a free game for iPod, iPhone, iPad, and Android that helps families of children with type 1 diabetes stay on top of their blood glucose monitoring. The game aims to engage children in their health management and improve adherence to treatment while having fun.

“Understanding the patient well is a difficult task made especially so if one has no personal experience with the disease,” Mr. Fergusson says. “We want to know their concerns and how the disease impacts their life so we can construct a narrative that will resonate with them, and so we can create an environment of the potential users of any game or application they develop.”

Mr. Fergusson says his team relies on an observational discovery process, as well as data from focus groups, patient research from non-profit healthcare organizations, and pharmaceutical companies to gain full knowledge of the players of healthcare related games.

“Customer insight drives everything we do, so ensuring that we work closely with healthcare experts and patient groups to establish what will work for them is very valuable,” Mr. Browning says. “Whenever possible, we aim to conduct market research to gain robust quantitative and qualitative feedback to ensure that our solutions are fit for purpose and will have the greatest chance of influencing the behavior change we are seeking to achieve. We also tend to take an agile and flexible approach when de-

ploying our digital initiatives, striving to be able to adapt solutions quickly in response to real-time customer feedback.”

One particularly interesting aspect of the challenge for healthcare game designers is that the rules of engagement are different in healthcare as opposed to entertainment, and can often feel counter-intuitive. Mr. Fergusson uses *Monster Manor* as an example.

“When we plan out an ‘entertainment’ game, we typically don’t care when people play and we generally want them to play as much as possible,” he says. “But when the goal is to get a child to check blood glucose levels at a certain time, the game planning must be different. We want them to stop playing after they check their blood sugar, and focus on health-related tasks. Instead of incorporating pure play features, we have to design the games in favor of the objectives necessary in the healthcare context.”

The More It’s A Game, The More It Stays The Same

While the objectives may be different, there are many mechanics in healthcare games that are similar to the pure play game design, and they must also be present in the design of a successful game.

According to Mr. Browning, the principles that underpin some of the most successful

Physician Interest in Social Health Gaming by Specialty

Specialists indicate that competing with peers in an online clinical challenge would be a fun and interesting way to learn about advancements in their field. Cardiologists and dermatologists are leading the way in adoption of gaming challenges.

Cardiologists	90%
Dermatologists	90%
Nephrologists	87%
Neurologists	85%
Urologists	80%
Rheumatologists	77%
Oncologists	70%
Psychologists	70%

Source: MedLIVE from WorldOne Interactive + Sermo. For more information, visit worldoneinteractive.com.

Transforming Healthcare Globally



non-pharma or non-healthcare games are equally applicable for engaging physicians and patients. For example, it is important to reward players for completing desired tasks and the game needs an appropriate degree of challenge and stickiness to keep it continually engaging and being used on a regular basis. Games for health must also make good use of in-game humor and be highly visual and aesthetically pleasing to play.

Brendan Gallagher, senior VP, emerging technology and channels at Digitas Health, also draws a parallel between pure gaming and gamification of healthcare solutions.

“A lot of the core tenants around building a good game still apply even if it’s designed around making better health decisions,” he says. “There must be direction, feedback, and choice within the game or else it doesn’t behave like a game.”

Mr. Gallagher adds that the game must be easy to learn but difficult to master, and within the healthcare context the game itself and the outcomes must be meaningful.

“When we are engaging in our health, the results must have value to us,” Mr. Gallagher says. “The data have to have relevance and the reason a patient is playing has to be important to him or her.”

Mr. Fergusson points out that a game must be designed so that it can account for different playing styles; a game that can only be played one way will have a shorter play life cycle than one that is always changing.

“Players need the flexibility to change their playing styles to stay engaged for the long term,” he says. “It is not in our nature to be the same type of player every time we play a game. Sometimes we want to get a higher score, or get perfect score, or beat our friends, or just kill time.”

A static game will quickly cease to be challenging and fun and will, therefore, fail to keep the player engaged.

Mike Marett, senior VP, head of global business development at WorldOne Interactive + Sermo, says the industry is in the beginning stages of incorporating game theory and design to healthcare delivery and clinical practice, so models are evolving and today’s approach to product development, including user experience design, will likely not be tomorrow’s. However, there are several guiding gamification principles for use today that transcend industry and audience.

“First, a game has to be intriguing; second, it must capture a participant’s attention, it should be entertaining; third, it should change over time, with new objectives, challenges, and rewards; fourth, it absolutely has to be fun; and fifth, it should be a competitive, social experience,” Mr. Marett says.

Challenges of Gamification in Healthcare

In a recent Cutting Edge Information mobile health study, which included a discussion of companies’ use of gamification, 35% of surveyed companies either currently have or plan to develop gamification platforms. Companies that did not list plans to develop gamification brought up challenges including uncertainty regarding the value represented by gamification, lack of gamification expertise, and concerns related to patient privacy.

“As companies can demonstrate the value of using gamification for learning and health management, and make it valuable for the end-users — either physicians or patients — gamification will continue to grow within the industry,” Ms. Ray says.

According to Rebecca Reeve, head of professional relations, diabetes Sanofi UK & Ireland, one of the biggest challenges for the industry is proving to upper management the value of gamification mechanics in the healthcare space.

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“We have to convince them that games do work in terms of influencing positive behavioral change and that they are not unsafe for patients nor do they promote the wrong type of message to our consumers,” she says.

**Sanofi UK & Ireland
Bring Gamification to Diabetes**

Since early 2013, the UK arm of **Sanofi Diabetes** has been working with game design firm Ayogo Health in partnership with the Diabetes UK patient charity organization to determine how it can better support the engagement of children with type 1 diabetes in the United Kingdom. Sanofi UK decided to launch a game called **Monster Manor** in the UK and Ireland only. With only 15% of young children managing to achieve their blood glucose targets, the hope is that this app will make a big difference to the way kids manage their diabetes.



“What has fascinated me the most is the psychology and science behind the game to try to modify and change behavior,” says Rebecca Reeve, head of professional relations, diabetes Sanofi UK & Ireland. “We want to support young children to engage with this life-long condition in a positive way so that blood glucose testing — a chore of diabetes but essential to support control of the disease — can be made a fun and positive experience.”

Response to the game has so far been very positive. Sanofi held a “play test” day with a group of young children with type 1 diabetes and their parents, along with a psychologist who interviewed the participating children pre- and post-game play.

“The feedback from the children has been outstanding,” Ms. Reeve says. “They described the game to be like Angry Birds or Temple Run, but special because it’s just for those with diabetes.”

Monster Manor provides a fun and rewarding experience for those children who struggle with the responsibility for testing and logging their own blood glucose. Testing and logging blood glucose within the game’s built-in tracker generates positive feedback to keep children engaged in this crucial aspect of their self-care with the aim of generating better outcomes.

Source: Sanofi UK & Ireland. For more information, visit sanofi.co.uk.

Ms. Reeve expects to gain some evidence that will meet this challenge through the Monster Manor app. The app is being evaluated by the Oxford Academic Health Science network (AHSN).

“The AHSNs have been established in England by the government to support rapid uptake and adoption of new technology throughout the NHS,” she says. “If the AHSN has a positive evaluation of how the game has supported young people with diabetes, then it will be adopted by all of the AHSNs for their patient populations. We are very excited to be working with the Oxford AHSN to evaluate the app for our UK and Irish audiences.”

Game performance can also be determined by measuring key performance indicators that align with brand objectives, Mr. Gallagher says.

“Many pharma brands tend to think along lines of adherence and compliance for game use, but there is a greater overall goal,” he says. “The measure has to be people becoming more engaged in their health. To motivate someone to be more engaged in his or her health to the point that it becomes an unconscious part of their activity is a true measure of success.”

Mr. Gallagher says he has become more engaged in his health as a result of using tools such as Jawbone and MyFitnessPal that gamify better health choices. He likes to track his progress, compare it with others, and although it is not a game, the process has game mechanics that influence his behavior.

“The key is to build an experience that will keep people coming back,” he says. “If someone only plays a game once and never comes back, that game is not a success.”

Mr. Goldman agrees engagement is the key to any game.

“A game needs to be engaging enough to sustain attention and have players wanting to play it again and again,” he says. “Creating a game that will fit the expectation of the user for ongoing engagement and fun is crucial to effective behavior change.”

This challenge exists under any circumstance, and especially when the audience is time-crunched physicians.

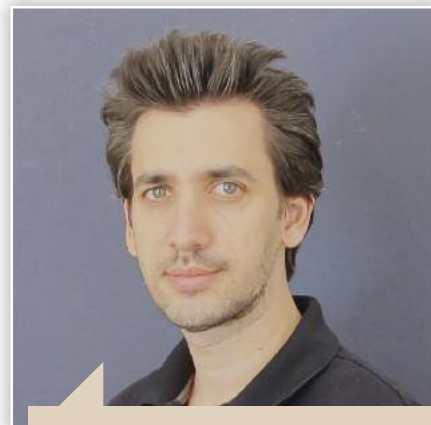
“When we ask physicians to choose between a game-based course and an online course, they prefer the game based,” Mr. Goldman says. “But the challenge is to be sure that once they open the game they find it engaging, relevant, and applicable to their work.”

Being able to connect the dots between real-world results and what is taking place in



“With ubiquitous connectivity and a healthcare system driving toward value-based payment, gamification is going to be an area of massive innovation.”

LEONARD KISH / VivaPhi



“Gamification has become more popular because today’s technology — driven by mobile devices — is so much more interactive and has become so prominent in our lives.”

RON GOLDMAN / Kognito Interactive

the virtual world of games is a challenge today, because the practice of using gamification in healthcare is so new.

“We’ve developed great games that keep people engaged, but we’re really just beginning to move from the virtual world to the real world of behavior change,” Mr. Kish says. “To do that, we’ll need for the two worlds to become a little more merged, with real-world



“As companies demonstrate the value of using gamification for health management, gamification will continue to grow within the industry.”

SARAH RAY

Cutting Edge Information



“You cannot bore people into behavior change; games must be fun.”

DAN CHICHESTER

Ogilvy Healthworld, part of Ogilvy CommonHealth Worldwide

feedback from game environments, as well as physical inputs.”

Sensors and real-world feedback loops need to improve to more easily make the connection, Mr. Kish says. Also, he cautions people to keep their expectations in check.

“If 10% of people respond with long-term behavior change to a program, that’s a good result,” he says.

Actually measuring the results of an experience such as playing a game can be difficult, but by using soft measures, such as how many users come back, how far they progress and how long they play, it is possible to track the uptake and determine the value, Ms. Ray says.

“The closer companies can develop games in line with an objective the easier it is to measure,” she says. “If they can prove that the target audience is reaching a specific objective, that could show that the game managed to increase their knowledge base.”

Mr. Fergusson says the industry needs increase its knowledge base around how and

why games work to improve health outcomes.

“We still hear a lot of the same objections from pharma,” he says. “We hear that people don’t want to play games, which is obviously preposterous. We hear women don’t play games, and this is not true. We hear that games are just for kids or this is healthcare and it’s a serious matter and not appropriate for a game — all not true. What’s more serious is than helping people engage with their healthcare?”

With the increasing use of game design within the healthcare space, another challenge exists in new requirements for staffing and skill sets, Mr. Marett says.

“Excepting for a moment the complexity associated with developing a game that aims to engage a diverse group of stakeholders who often have very different objectives and motives, there are also practical challenges introduced by the need to identify, recruit, and retain innovation experts who have both deep and broad experience across a variety of complementary domains.”

Mr. Marett recommends building a cross-functional product development team of individuals steeped in behavioral economics, user experience design, communications, clinical practice, and analytics.

The industry is on a big learning curve trying to determine where gamification fits in to its overall strategy, but once the value of gamification becomes clear, more companies will jump on board. According to Ms. Ray, the biggest challenge is in change management, not so much resistance to games.

“The industry is not as familiar with gamification strategies and mobile digital strategies, but once companies understand how games provide value and they are not just for fun, the uptake from pharma will increase,” she says.

Social Aspect Trumps Scores

It is the social aspect of games that create the biggest opportunity for influence, Mr. Fergusson says.

A few years ago, Ayogo Health developed Healthseeker, a game designed for people living with diabetes. The product stemmed from a collaboration between Ayogo, Diabetes Hands Foundation, and Joslin Diabetes Center, and was supported by BI and Lilly.



“When patients are engaging in their health, the results must have value to them.”

BRENDAN GALLAGHER

Digitas Health
@digitas_health

Healthseeker was designed to help adults living with diabetes or those at the risk of developing diabetes with specific lifestyle and nutritional challenges. The game creates compulsion loops around reciprocal social obligation, gifting, collection, and achievement to motivate action and engage people in a healthier life. The social aspect of the game and its ability to immediately reward small actions in short periods of time in favor of struggling with bigger commitments that take longer periods of time to experience rewards made it a success.

“We discovered from Healthseeker that points, badges, and measures actually didn’t make much difference to people, but those users that received messaging from other people in the network were more engaged — playing longer and completing more program elements,” Mr. Fergusson says.

As the uptake of gamification techniques for healthcare solutions creeps up the pharma flag pole, the industry needs to embrace game mechanics as a way to help patients manage their disease, and help physicians better understand treatments and diagnose disease.

“The industry can’t get a different result by doing the same thing every time, and pharma, like all industries, needs to take advantage of the opportunities to innovate created by new mobile and social devices and channels,” Mr. Fergusson says. “The FDA has given us some guidance about smartphones and med devices and social media, and now is the time to be innovative and look forward. Those who get out in front and learn and build and test will be the ones who set the pace for next 10 years, while everyone else plays catch-up.” ^{PV}



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Mobility Enhances Gamification Growth

Widespread mobile adoption brings more opportunities for game playing.

By most estimates, mobile phone penetration now exceeds 90% of the total U.S. population. Roughly 62% of these mobile phone users operate smartphones. Additionally, about one-third of all U.S. adults own a tablet computer. Taken together, widespread consumer adoption of mobile devices has contributed to the launch of new companies, led to exciting new products and services, and re-prioritized the development schedule of vendors and providers.

“In many instances, mobile platform development is now ahead of desktop platform development,” says Mike Marett, senior VP, head of global business development, WorldOne Interactive + Sermo.

Andrew Browning, digital lead, at Sanofi UK & Ireland, says the industry has seen a massive explosion in the gamification market in recent years and he expects it will continue throughout the decade.

“We believe that the opportunity to engage with patients and healthcare professionals using mobile devices will continue and will be fuelled by the ever-increasing adoption of smartphone technology,” he says. “In the UK, we are adopting a mobile first strategy to try and stay at the forefront of this trend.”

Mobile is going to be as disruptive to healthcare as e-commerce was to retail, says Brendan Gallagher, senior VP, emerging technology and channels, at Digitas Health.

“Mobile is the great connector and the most powerful movement we have seen in healthcare to date,” he says. “We haven’t seen this industry’s version of Amazon yet but we will.”

According to Mr. Marett, a recent survey

FAST FACT

USERS CHECK THEIR
SMARTPHONES AN AVERAGE OF
150 TIMES — OR EVERY 6 1/2
MINUTES — DURING A WAKING
16-HOUR DAY.

Source: Tomi Ahonen, mobile technology consultant

from HIMSS determined that 93% of physicians are using mobile technology in their day-to-day activities.

“As a result, it’s reasonable to anticipate that companies servicing the physician market will continue to sharpen their focus on mobile engineering,” he says. “Not only should this accelerate improvements in user experience, but it should also trigger a wave of new health management and care collaboration services that take advantage of emerging technologies to drive meaningful connections, which should help to reduce cost, enhance satisfaction, and improve outcomes.”

Mobile provides the most convenient platform for gamification and it is this always-on environment that increases engagement. For example, not too many years ago, interacting with a computer always required using a mouse. Today, consumers can be much more interactive on mobile devices just by using their finger.

“Gamification has become more popular because today’s interactive technology — driven by mobile devices — has become so



“The smartphone is not just a computer. It contains real people who care about us and this is what is going to help us change our healthcare behavior more than anything else.”

MICHAEL FERGUSSON / Ayogo Health

prominent in our lives,” says Ron Goldman, CEO, Kognito Interactive.

Another factor in the growth is that learning and training approaches have evolved over time along with technology. Even though games are not new — simulations have been around for a long time — the way people expect to learn has evolved.

“Our method of learning has advanced from reading a book or listening to lectures to having online discussions, engaging with interactive websites, and now playing games,” he says. “There’s been increasing sophistication of learning strategies over time and game me-

What Comes First, The Game Or The Player?

When designing a healthcare game, it's critical to start from the inside out, says Dan Chichester, chief digital officer at Ogilvy Healthworld, part of Ogilvy CommonHealth Worldwide. Choosing a "type" or genre of game first is a form of artifice, and with the "bright and shiny" qualities of games it's easy to select a path based on popularity or the "easy sell."

"Everyone loves Candy Crush — so the 'quick fix' would take a wrong path to, let's do Candy Crush for Cancer," he says. "Instead, we need to first determine the goal, develop a behavior change strategy, and then add fuel."

Everything else is about harnessing the power of those core elements in the form of gameplay:

- » What specific behavior are you trying to change?
- » Which barriers to the desired behavior will be addressed by the game?
- » Which drivers that support the real life desired behavior will be reinforced by the game?
- » What does the target find fun and challenging? (So the game will be an engaging draw.)

As in all things with health and wellness, the person in question needs to inherently care about altering his other behavior, be that changing lifestyle, staying adherent, etc. If players don't care, all the leaderboards in the world won't influence behavior. But if the interest is there, games are unique in their interactivity and ability to put the player in a receptive state — to boost motivation, provide feedback on progress, build confidence to achieve, and realistically help get a person over his or her individual hurdle.

Source: Ogilvy Healthworld, part of Ogilvy CommonHealth Worldwide. For more information, visit ochwww.com.

chanics and gamification are the latest evolutions."

According to Mr. Gallagher, much of today's growth is around third-party con-

FAST FACT

THERE ARE 2.1 BILLION MOBILE WEB USERS — 29.5% OF THE GLOBAL POPULATION — IN THE WORLD.

Source: The International Telecommunication Union

sumer-facing products, but there are just as many opportunities for pharma to connect with healthcare providers and consumers through gamification.

"There are a lot of Silicon Valley start-up companies that are taking advantage of gamification on the consumer end, but more pharma brands should get involved from a provider and manufacturer standpoint," he says.

For example, a pharma brand with a product for a disease state that has an engaged patient market but is underserved by the consumer revolution could use quantified self-tracking tools to create an entire experience for the patient community and ultimately use those data to help formulate better stories and outcomes for the patients themselves.

Another advantage to the quantified self-mobile device movement is that game progression can be personalized depending on the behavior of the player, says Dan Chichester, chief digital officer at Ogilvy Healthworld, part of Ogilvy CommonHealth Worldwide.

"A mobile device can track a person's activity stream, patterns of interest, and behavior," he says. "This performance data suggest opportunities for more personalized game progression based on what a person is doing naturally. Many games are based on a straight linear form of leveling up, proving competency in a lower level to move to higher achievements, that is the same for all. A mobile game can learn from an individual's activity — healthy or unhealthy — and then use that data to filter and recommend fun learning experiences that are unique to that player. Further, an engaged doctor could build on this information to help evaluate appropriate measurement and help define compelling rewards within the game, built on the physician's actual knowledge of the patient."

Another advantage of the mobile device era is the ability to collect information on patient behavior.

"Mobile devices can act as the hub to collect information on behavior, which is a huge advantage," says Leonard Kish, principal and co-founder of VivaPhi. "Sensors will continue to be added that can improve how behavior is meas-



“ We could start to see better health outcomes that rival a biological entity, and games could be defined as digital therapeutics.”

BRENDAN GALLAGHER
Digitas Health
@digitas_health

ured, which will open the door to better and better games that merge the real world and virtual worlds by modeling what's happening in the real world. There are amazing sensors that will emerge, such as sensors that can measure how much someone eats and drinks, for example, a group in Korea is working on how a sensor that can be glued to a tooth. The result will be data on well hydrated someone is, whether he or she has taken medication, and so on. The industry has been good at measuring output from our bodies. The next wave of innovation will be sensors to better measure inputs and internal states of the body. Through mobile connectivity, we'll have a clear picture of behavior and be able to help people take control of their own lives."

The social aspect of mobile is another element that increases effectiveness for behavior changing platforms and, therefore, a great fit for healthcare gamification.

"The powerful thing about smartphones is that we now have a universe of other human beings in our pocket," says Michael Fergusson, CEO, Ayogo Health. "The smartphone is not just a computer. It contains real people who care about us and this is what is going to help us change our healthcare behavior more than anything else."

Tracking and improving healthcare behavior could over time have as much benefit as a drug treatment for some diseases, Mr. Gallagher says.

"We could start to see better health outcomes that rival a biological entity, and games could be defined as digital therapeutics," he says. "This could dramatically alter the life-sciences industry and how it defines itself. This is an incredibly exciting time in the mhealth space." **PV**