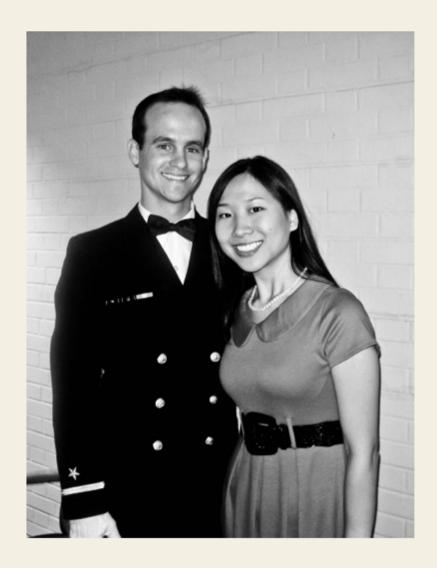# Chapter 9: StickWars

Somewhere in the world, 1,000 feet or so beneath the surface of the ocean, you'll find John Hartzog, creator of the hit iPhone app *StickWars*. Today, Hartzog is an officer in the U.S. Navy where he is part of a submarine crew. His job involves navigation and managing the sub's on-board nuclear reactor. Of all the Appillionaires, Hartzog is the only one to have graduated from tinkering with the iPhone handset to controlling atomic hardware. If you thought your eight-core MacPro was a cool development platform, take a look at Hartzog's nuclear marine propulsion system and weep. His new occupation does make it harder for him to update the *StickWars* app, though.

"Now I spend a lot of time in a metal tube under the water. The WiFi is horrendous down there; it never ever works," Hartzog jokes. "Something to do with the several feet of steel between you and everything around you. It kills all reception."

John Hartzog, submarine officer and creator of *StickWars*, pictured here with his wife.

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Defending the Castle

Hartzog created the smash-hit app *StickWars* during the brief time between the final days of college and his enrollment in the Navy. It's a castle-defense game where the aim is to protect your castle as waves of attackers attempt to storm the stronghold. You fling the attackers away with your fingers. When the game begins, you're left to defend the castle by the speed of your finger reflexes alone, but as the levels progress you can entrap archers and wizards to protect the walls. The process involves coaxing marauders into a prison from which you can then "recruit" members to defend the castle. If you're upset by gnarly scenes of violence

you can tone down the amount of visible blood in the game's settings — you would, however, have to be unnaturally queasy if you felt any deep sympathy for the game's iconic stick-figure characters. They're basic human-like forms that give the game a warm, homemade charm.

StickWars is a castle defense game. Players must use their fingers to attack the aggressive invaders.

SOURCE: Reproduced with permission of John Hartzog © 2011 John E. Hartzog.

"I thought it would be really fun to have a game where you throw things around the screen," says Hartzog. "I was playing other games that were similar but the motion wasn't very smooth. These games were almost fun, but ultimately not satisfying in the way they were implemented. I thought I could put something better together in a few weeks, and I did."

Hartzog has always been "the crazy computer science guy."

The Early Years

"I technically sold my first piece of software when I was 13 years old," he says. "Well, I say sold, but I had to give it away for free in the end. It was a Visual Basic app and it was a security system I designed to stop my brother and sister from using my computer. I put it up on a shareware website and started getting requests to buy it, but I was only 13 and couldn't set up a credit card transaction system."

Computers had always been a part of Hartzog's life. He loved science and programming, but says that he always had a feeling that computer programmers wouldn't be making much money by the time he left college, so he decided to join the Navy instead.

"As far as I could see, all the jobs were getting outsourced," Hartzog says. "So my focus was elsewhere. I love coding, I really do, but I'm dreading the day I get out of the Navy in three years and go looking for a job; I worry there won't be any great programming jobs out there."

Perhaps he doesn't have to worry if he can keep

putting out apps like *StickWars*.

Waiting to Surface

Hartzog began building *StickWars* in 2009. The game was completed shortly after he graduated from college in May that year and he continued to update the app even when the Navy enlisted him full-time. Because, as Hartzog puts it, he "had no social life at the time" it was possible for the young submarine officer to keep updating his app in spare moments during training, although he has now turned that responsibility over to people who spend less time submerged in the depths of the ocean. iPhone gamers aren't generally used to waiting for their developer's submarine to surface before an app can be updated.

"*StickWars* was my first attempt at making a game for the iPhone," says Hartzog. "The App Store had been around for a while and there were games that I imagined would be fun to play on a touchscreen — especially one so responsive. But when I saw what games were out there, I realized: 'Wow! These are really, really bad.'"

Hartzog decided he would hide himself away and code like a bandit to create something better.

"My patient girlfriend, who is now my wife, let me sit in my dorm room all day long and code. I had to do a lot to make it work. I stayed in my room for quite literally days, doing the classes I needed to and programming the game."

Taking a Gamble

Encouraged by the lack of competition in the early days of the App Store, Hartzog set about making the kind of game that he himself would have enjoyed playing. It took him just three weeks to get the first version of *StickWars* made and on the App Store. He hoped to capture iPhone gamers' appetite for direct-manipulation of the characters on-screen. Unlike many games at the time, *StickWars* let players physically grab and throw the stick figures around. Today the mechanic seems like a logical use of the iPhone technology, but back then it was rare

to find a game that used stick-figure physics in a compelling and — more importantly — well-polished format.

"It was interesting to have things flying around the screen in a way other games weren't doing it," says Hartzog. "The biggest games at the time were *Pocket God* and *iShoot*, but they weren't as interactive or as dynamic back then. *StickWars* provided more of a direct translation from touch to action."

Hartzog says he had no expectations of success when he launched *StickWars*. The only reason he was able to program the app is because he took advantage of Apple's offer to let developers download Xcode (the software programmers use to develop for the iPhone) for free. But when Hartzog came to submit to the App Store he would have to pay the full developer's fee. Amazingly, at the time, he thought he was probably throwing his money away.

"I was super worried because it was $99 to sign up.

I was seriously concerned that I would not get my $99 dollars back in app sales. I thought, 'What a potential waste here, blowing my money on this.' Up to that point it had all been a hobby. That was my state of mind at the time. I had been doing it for fun."

"StickWars was a fun game; my computer science buddies were entertained by it. But I had no idea how it would be received by the public. When it sold hundreds of copies, I realized it was something much bigger than I'd imagined."

Doubling the Content

StickWars raced up the App Store charts and it became clear that Hartzog had a hit on his hands. As the app climbed, Hartzog continued adding more and more content, rapidly increasing the value and popularity of the game. He estimates that the game content was doubled in those first few weeks.

"The tipping point was when it hit the top 100. Then I knew that *StickWars* was going to be a massive

success," says Hartzog. "It was a sweet deal. I didn't celebrate yet, but I stopped going out with my friends and just worked solidly on it."

"I kept cranking away at it. I hit a momentum and realized that, if I kept updating the app every three weeks, I could accelerate the rise," he says. "I added a ton of stuff to the game, because after just being on the store for a couple of weeks, it was selling many hundreds of copies and I thought: 'this is really worth my time.' Of course, I was also doing it for fun."

Unlike some app developers, Hartzog makes a very clear diagnosis of why *StickWars* met such a warm reception from the iPhone owning masses. It was, in his view, a fortunate combination of being first to market with a seamless control system for throwing around the stick figures, but also aiming for a much higher quality of app than his competitors had managed to put out.

Cocos2d Saves the Day

"There were no other apps at the time that responded to touch in a natural and fluid way. With StickWars you could drag your finger as quickly as you could and the game reacts quickly without jerking. The characters behave as you'd expect a figure to respond in a physics environment. It was far above the level of any touch games available at the time."

Hartzog makes an interesting observation, and one that seems to hold true for all the Appillionaires. Not only did the most successful app designers come up with interesting ideas, but the touch-input system for their apps seems to have been uniquely well crafted. Whether it's the super-smooth animation of *Doodle Jump*, the graceful line drawing in *Harbor Master*, or the satisfying trajectory traced by an *Angry Birds* character, there is a running theme: The best apps seem to pay attention to the tiniest details of the finger mechanics used to operate them. There was also one other essential ingredient that Hartzog relied on.

"The large reason why I was able to do this is because of the Cocos2d library," he says.

Cocos2d is a free library of pre-built graphics code that developers can use to save themselves hours of coding and experimentation. Instead of writing hundreds of lines of code to simulate gravity, for example, you can use a Cocos2d library to automate the process in a single line.

"When I look back it was fortunate timing. If I'd started in 2008 it wouldn't have worked; I would have had to code all the Cocos2d stuff myself," says Hartzog. "There's a lot of work needed to create realistic physics sims. Luckily, by March the library of Cocos2d code was there to use. I was able to grab it in a near-finished state — just one month earlier and I would have had to recreate all the work. Cocos2d was a big factor in the success of *StickWars*. It was very lucky that a free Open Source graphics library was being created in parallel with my app."

A Life at Sea

At the height of *StickWars*' success, Hartzog was pulling 12-hour days, 7 days a week, working constantly on the app. His attention to *StickWars* gradually waned as his military career began to take over, but he was lucky enough to have had enough downtime to push updates during brief gaps in his training and used it to make tweaks to the *StickWars* universe.

Hartzog thinks the success of *StickWars* has changed his life very little. His decision to join the Navy was pre-*StickWars*, so in many ways his future was already mapped out.

"I knew what I wanted to do before I made *StickWars*," says Hartzog. "I love working with computers and I love building things, but I didn't want to be an iPhone dev all my life. I wouldn't quit the Navy to become another iPhone developer."

"Anyway, I can't really just say 'I quit the navy!'" he laughs. "I have a company now that has an amazing product and great relationships with other developers. We're continuing to launch stuff, and occasionally I can help, but in terms of day to day, my commitment is to the Navy."

What does Hartzog make of the rise of the bedroom programmer and the fact he was able to sell his app to a global audience?

"I think it's fantastic," he says. "When you think about it we've had the technology to allow us to do this for 10 years. The only reason I couldn't sell the software I wrote when I was 13 were the legal, technical and financial barriers. There just wasn't a convenient distribution system for software. Now you have people who can write fantastic software in their bedroom. One person working for a few weeks can make something amazing. Before Apple came along, things were tough for individual pro-grammers."

Hartzog says he was hugely inspired and influenced by Sean O'Connor, a British games programmer. O'Conner was a rare bedroom-developer success story well before the App Store. He made software for Palm OS, the Palm Pilot, and the PC and became a cult-programming icon in the late 90s. O'Connor was once in similar situation to Hartzog.

"O'Connor had a job as programmer, but he started making games on side," says Hartzog. "He eventually made so much money he quit his job and became a successful bedroom programmer. It was fascinating to watch that happen years ago. He is a very inspiring figure for me — someone who just enjoys making games and does it so well can make a career out of it."

"It is so much harder now," says Hartzog of the current app scene. "I can't imagine what it's like for those coming in as new independent developers. It can still be done — you can still build a hit app — but the number of indie developers appearing in the

top of charts is very quickly dwindling. It's getting more competitive."

"When I worked on *StickWars*, I did all the coding and design all myself, but after I reached that tipping point where the app was successful, I hired a friend to work on the graphics for me, and some people to create the soundtrack — things I couldn't flesh out myself."

"I was lucky because *StickWars* was an early success. I had demonstrated that I could make money before I had to invest money. I knew I would get a paycheck at the end of month, so I could pay to improve the graphics and sound. But people are taking a big risk now. They're putting that money up front. You could easily spend $10,000 or more to make a game that totals just $100 in sales."

As with the other Appillionaires, it seems like Hartzog simply enjoys applying himself wholeheartedly to the task at hand. Clearly he's driven by a love of technology, and I can't help but wonder if the App Store just wasn't exciting enough for him. Given a choice between programming casual iPhone games for middle-class commuters, or piloting a nuclear submarine across the seven seas, he's probably taken the more exciting option. It's unlikely that many *StickWars* gamers know that the man who created the app is submerged in the belly of a steel beast, patrolling the waters, but next time you see someone playing the app you might point it out.

Summary

Here's a roundup of the important points covered in this chapter:

• Hartzog's advice to someone who wants to give it a shot? "Work independently. That's what I did at the start. Focus on making a fantastic game and worry about money later. First, make a great product."
• Hartzog doesn't get much time to work on apps these days, and his job in the Navy couldn't be further from a programming task. Today he deals

with the physical engineering realties of a nuclear submarine reactor and his responsibilities navigating the deep ocean. If there's a lesson to be drawn from this it's follow your heart. Hartzog still dabbles in apps, but he knew when to walk away.

• I asked Hartzog if his experiences in the military might inspire a future iPhone game? "Maybe," he told me. "At the moment I'm just enjoying what I do." If you're an app designer, you should look for inspiration in the world around you. The more unusual and adventurous your everyday life, the more ideas you'll have for a great app. Don't obsess over app ideas, but keep an eye out.

• *StickWars* demonstrates that simple artwork can be extremely effective in a popular iPhone title. Don't make the mistake of assuming that iPhone gamers are married to a particular polished look. Just like *Doodle Jump, StickWars* embraces its homemade roots. App makers should be bold and honest with their app designs.

Chapter 10: Angry Birds

The elastic of the catapult groans under pressure. Suddenly it snaps furiously back, releasing a small bird high into the blue sky of the Pacific Ocean. Faster and higher the bird climbs, now just a speck above the island below. For a moment it seems suspended in space. Then slowly, delightfully, it reaches the peak of its trajectory and begins to fall to the ground, tracing an elegant arc through the air.

Smash! The bird collides with a wooden castle on the island's surface. The beams of the castle wobble and creak. For a moment it looks like the structure will hold, but then the bird tumbles down the outer wall, knocking out a vital support beam. The castle shudders and collapses, instantly killing its inhabitants: two green pigs.

The bird squawks for a moment — perhaps shocked by its involuntary slaughter of the pigs — it then sheds a few feathers and, without any particular fanfare, gently explodes.