Digital Platform Strategies for the Connected Home

Best of breed app based audio/video, comfort, security, communications and home control solutions for the custom integrated home

By Gordon van Zuiden, President, cyberManor
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Introduction
Smart mobile devices have dramatically changed the way we live, work, play, and learn. In the same manner that desktop personal computing changed in our lives in the latter part of the 20th century, smart mobile devices are changing our lives at an even more dramatic rate in the 21st century. In 2014 there were approximately 300 million desktop computing devices shipped around the world (and that number is staying relatively flat). By comparison, 2.3 billion smart mobile phones and tablets were shipped last year - a number that is growing at about 5% year. 2015 smartwatch shipment estimates cover a wide range, from 21 million to 65 million - but that's far higher than the 11.3 million to 19.5 million first-year shipment estimates for the Apple iPad when it was introduced in 2010*. About 17% of U.S. Internet users now own a wearable device. The expanding category includes everything from the Apple Watch and Google Android Wear watch to Web-connected smart rings.

The focus of this white paper will be on Apple based AV and home control solutions because of Apple’s ongoing innovation in smart phone technologies and dominance in the phone, tablet (and now watch) marketplace. The high resolution retina screens of the Apple iPad and iPad Mini, coupled with the fact that over 250 million of these products have been sold to date, have made the iPad the “de facto” platform for most of the leading home control and AV applications. Since the iPad Mini was launched in late 2012 the dominance of iOS mobile control in the home is even more pronounced - the 7” screen is the ideal form factor for most home control applications. With this newer, lower cost iPad Mini we frequently place these tablets in charging cradles in each room of the home that has music, lighting, or TV control requirements.

* Data from a Gartner Worldwide PC and Mobile Devices Shipment Report dated July 7, 2014. Gartner, Inc. (NYSE: IT) is the world’s leading information technology research and advisory company and Investor’s Business Daily: 6-25-2015
With Apple’s recent introduction of the smart watch we may find that this complementary touch screen product to their phone and tablet line will also be used for many home control functions - such as checking the front door camera, locking or unlocking the front door, or arming and disarming the home. There are many simple, glance-able one touch home control applications that are very well suited for the new Apple Watch. (For a more detailed review of the new Apple Watch please see Appendix 2).

Many of the solutions proposed in this white paper can also be implemented on Android based platforms – but Apple’s leadership and significant market share have influenced most AV and home control application developers to write their applications for the iOS platform before they embrace the Android platform. As a result this white paper will focus on mobile iOS application solutions for the clients of the custom home technology professional and the key design decision parameters involved in optimizing iOS based AV and home control solutions. These AV and home control solutions are primarily integrated into larger homes – typically over 2500 square feet in size – since the demand for customized home control and AV distribution increases with the size of the home. A one bedroom can have a whole house music system and TV zone all in one room – there is not much of a need for total home control and AV distribution. On the other hand, a homeowner with a 5000 square foot home with 4 or 5 bedrooms, several zones of audio and video, multiple heating and cooling zones, a security system, an advanced lighting control infrastructure and surveillance cameras becomes an ideal candidate for the AV and home control solutions outlined in this white paper. These homeowners will often employ the services of a custom home technology professional of their design and integration work.

Digital Platforms for the Home
There is a paradigm shift occurring in the manner in which electronic products are being designed, built and integrated into the home. A shift that was embraced by Sonos over a decade ago is now becoming the standard by which other residential network connected products can be judged. In 2004 Sonos introduced a music player for the home that was designed from its inception to be a whole house music distribution platform that would be enhanced by software over time to remain current - instead of a hardware only solution that would quickly loses its value. The Sonos software has been upgraded over 100 times over the last 10+ years to insure that their music platform enhances in value to their clients each year - a dramatic shift from the traditional home electronics model of regularly purchasing and installing new hardware to keep up with current feature demands.

Shown below is a partial list of some of the key new features that have been added to the Sonos player platform over the last 10+ years - at no additional cost to their clients:

- Dozens of new streaming music services, including Spotify, Deezer, and Beats
- Enhanced their apps for the Apple, Android, and Windows desktop and mobile platforms
- Enabled their amps and Playbar speaker to be coupled to provide surround capability
- Provided multi-location home support for the seamless transition of a mobile Sonos controller to multiple residences
- Enhanced the functionality of their player buttons
- Simplified the set up of new systems and adding Sonos equipment to existing systems
This fundamental shift in the intelligence and software upgradability of home electronics have set the stage for a consumer expectation that electronic products purchased today should actually improve over time. This new model fosters product loyalty and good will from the homeowner to the manufacturer of the product and the professional integrator that recommends and installs these products. Instead of frustration and disappointment over the decline of a product’s value and functionality over time the reverse is now true - delight that the electronic product purchased yesterday is more useful today at no additional charge and without the need for an upgrade service call.

This new digital platform based product model is now flourishing because the following communications infrastructures are now prevalent in the United States:

- High speed always on broadband connectivity is available to almost every home in the United States
- Home networks have been installed in almost every home providing wired and/or wireless connectivity to the internet from every room in the home
- A national cellular infrastructure provides internet access from every heavily populated region in the country – allowing remote access to electronic products on the home network
- An iOS or Android mobile control phone can be found in almost everyone’s pocket or purse

When a new electronic product is introduced into the home it often follows the following design parameters:

- There is an embedded communications chip set that enables it to connect to the home network over a wired or wireless connection
- The product design is clean, functional and with minimal number of hard buttons - features are added with software upgrades, not hardware replacements
- Control of the device is accomplished via a well-engineered and elegant graphical interface that runs on a wireless smart phone or tablet device
- Typically the manufacturer will have a cloud service that contains information about the state of their product and allows the consumer to control it from anywhere in their home or when they travel

Almost all the new connected home technology products introduced on Kickstarter and Indiegogo follow this formula. But even established, mature companies in the home are following this new software platform strategy. When Jarden Corporation wanted to add this level of network connected intelligence to their Mr. Coffee Pot and Crockpot branded lines they partnered with Belkin to add this functionality by adding the Belkin WEMO line of chipsets and control software. When Serta wanted to add tilt/raise and massage mattress control to their high end mattresses they turned to a Santa Barbara software engineering company called Ergomotion to add these app based control features. When Liftmaster wanted their garage door openers to be opened and closed by a smart phone inside or away from the home they turned
to the Chamberlain Group for the appropriate gateway technology and smart phone software to differentiate their high end line of garage door openers.

The list of products adding network connectivity and app based control is growing daily. Even 50+ year Dacor Industries, a high end manufacturer of kitchen appliances, is introducing a high end oven that can be controlled by a smart phone locally and remotely. Samsung and LG have a new washer and dryer combination that can be controlled by a smart phone and NuHeat introduced a high resolution color thermostat for their electronic floor heating systems that can be controlled by a smart phone app. Nordic Track offers an indoor treadmill that lets you program almost any route you would you would like to run in the US and see your course on the treadmill’s color touchscreen via Google Street view. As you are running your route on the treadmill the application is smart enough to change the incline up or down in accordance with the actual real world run!

**Today’s Mobile Connected Lifestyle**

With the growing acceptance of watch and graphical car screen interfaces (such as the Apple Watch and CarPlay), the world of app based solutions for the home from a phone or tablet will be complemented by these new wearable and automobile interfaces. These app interfaces will frequently be used outside the home so the need for a well designed and integrated residential system that provides both home and mobile based entertainment, comfort, security, and communication solutions becomes even more important to meet the expanding technology needs of today’s connected homeowner.
The Modern Home Digital Ecosystem

The following diagram illustrates the relative importance of these intelligent electronic ecosystems in most US homes. At its core is the requirement that the entire home is networked, both wired and wirelessly and connected to high speed always on broadband internet connection. These core networking products (modems, routers, switches, wireless access points) are the foundation for the network enhanced entertainment, comfort, and security solutions in the home.

In the inner primary service ring are the fundamental entertainment, comfort, and security needs required in almost every home - music, TV, heating and cooling, access control, security. In the outer secondary service ring are needs that enhance the intelligence and value of the home but typically follow the adoption of the primary service ring products. These secondary service ring products include irrigation control, health care monitoring, pool/hot tub control, energy monitoring, garage door openers, etc. (See Appendix 1 for specific phone and tablet best of breed product recommendations for many of the platforms shown in this diagram.)

It is important to understand that in this network driven home ecosystem each category will be filled with companies competing to become the digital platform standard for a given service need in the home. Companies that foresaw this intelligent home ecosystem model have an inherent advantage in becoming market leaders in their given category - as Sonos has done for whole house music and NEST in heating and AC control. In the TV distribution space we see leadership from companies such as TiVo, Dish and Direct TV. But in most of the other platform
categories in the home we not seen a clear winner. One would expect that in the next few years we will see manufacturers dominate in a given platform based on the strengths of their product design, hardware reliability and commitment to steadily improving the software suite of services for their product.

Keep in mind that market leadership in a given platform today does not ensure dominance in the future. In this new world where software based services enhance the value of a platform over time - a company whose software services are not enhanced on a regular basis will see their leadership position erode to competitive companies that target software platform enhancements as a key strategic initiative for their company. There are many companies that make excellent speakers and amplifiers that fill up a home with music - but very few companies place equal, if not more, focus on the excellence of the software component of the music platform to enhance the whole house music experience. At no additional charge to the homeowner, Sonos has improved their software to complement their whole house audio platform experience almost every quarter over the last 10 years – enabling them to maintain and extend their leadership position in delivering best of breed music services throughout the home.

"We have a lot of opportunity just in the few things we are doing...we have one little role to play in the smart home and that is plenty big for us."

John MacFarlane, Sonos CEO (from a 2013 interview)

This level of commitment to excellence in the product platform over time keeps Sonos in front of its whole house audio competitors and delivers value and delight to their existing customers on an ongoing basis. Given their success it would be very easy for Sonos to extend their control into the other areas of the home such as video distribution or HVAC or security control. But Sonos knows that there is still so much value they can add to the digital whole house music platform that they will not be enticed (or distracted) by pursuing these other areas. Doing so would compromise their engineering resources to deliver the best whole house music experience and open up the door to competition that could threaten their market leadership position. This is a key strategic initiative at Sonos and is fundamental to maintaining and enhancing the market lead they now enjoy.

As a direct result of their success and acceptance into the home Sonos is now a platform that enjoys a third party ecosystem of their own. If you need a Sonos compatible wall mount you can order one from Cavus or Flexson. If you want to turn their platform into an intercom or a public address system you can buy a 99 cent application from People Tech to enable this service. You don't have to look any farther that the iPhone or the iPad to see the importance of becoming an ecosystem platform - software apps and 3rd party hardware products have done more to entrench Apple's leadership position in the mobile smart phone and tablet market more than anything that Apple could have done by themselves.
ASPI Connected Home Model

Another way to look at this shift from hardware to software based feature upgrades in the home is shown in the following ASPI (Application, Services, Physical Interface) connected home model diagram:

In this model of the custom integrated home the physical products (such as speakers, amplifiers, hi resolution TVs, structured wiring, a security system, etc.) have all installed by the custom electronics integrator. Once this physical hardware plant is in place the entertainment, comfort, and security value of the home can now be enhanced by software improvements to the respective physical hardware platforms, iOS and Android touch screens throughout the home. The home's livability actually improves over time - but the critical decision for the homeowner and the custom electronics integrator is to select the manufacturer of a digital platform for a given service that demonstrates the financial commitment and committed engineering resources to innovate and add value to their platform on an ongoing basis.

This represents a fundamental difference in how one selects the best product for a given category - it is less about what the product feature sets are today but how they can be enhanced tomorrow. For the first time we think of technology as an investment that increases over time if we pick the correct platform today.

When we choose a pool or hot tub controller - do we pick the one that has the most button feature sets on the wall or one that we can use from our smart phone that adds remote control capability, shows a history of the heating furnace usage, and perhaps has a unique temperature setting for each person that uses the hot tub. Which pool control company will dedicate the
engineering resources to ensure that they become the leader as a pool and hot tub control platform?

Now it is more important that we gauge a company’s commitment to their platform enhancement efforts than the product specifications that the company delivers today. The net value of their technology to the homeowner will not only be measured by what it can do today - but what will be its aggregate value to the customer over the life of the product.

Single App Home Control vs. Multiple App Home Control Solutions

While a single application total home control solution would seem to be very desirable solution over using multiple applications to control the home - the reality is that this model can actually stifle the innovation of the digital platforms that they control for the purpose of a providing a unified control system. One of the primary appeals of the best of breed multiple app hardware/software design model is that these systems rarely need upgrading from a custom electronics integrator or extensive customized programming because the programming and feature updates are provided freely from these manufacturers on an automated basis to the clients’ products and mobile control platforms. Home technology solutions no longer require expensive long term customized programming to maintain and update electronic systems. This is a win for clients and a win for the custom home technology integrator. Client satisfaction is extremely high as a result of the integration of these reliable, self-upgrading and healing systems.

Each time a company dedicated to providing the best AV or home control platform over time (such as Sonos for whole house music) improved their product platform on iOS and Android control devices they would also need to ensure compatibility of their software and/or hardware enhancements with all of the total home control platform operating systems (or this effort would have to be taken on by the total home control platform or a third party). This effort would deter Sonos’s engineering resources from continuing to improve their own whole house music platform for the significantly larger iOS and Android operating system markets.

Supporting multiple total home control platforms also represents a major support issue when Sonos needs to maintain compatibility with an operating system that is not only controlling their system but all of the other digital AV platforms in the home. If the TV doesn’t turn on because the total home control system that manages the TV and the Sonos whole house audio isn’t working properly is it the problem of the total home control platform company or Sonos? Sonos doesn’t want that support issue - nor does cyberManor. cyberManor wants the best of breed home AV and control products being managed by the software written by the companies that manufacture these products - this gives our clients and us the greatest assurance they will work reliably over the long term - with a minimal amount of costly upgrade programming and service calls.

A frequent argument for a single home control application is the ability to program interoperability – or automation scenes – between subsystems. For example, one may want to
leave their home and arm a security system that will automatically turn off all the lights in the home, lock the front door, and turn down the thermostat without opening up multiple applications to complete this task.

Today, these inter-app automation scenes are now enabled in the cloud or via small home based, app controlled hubs – reducing the need for expensive total home controllers. App interoperability is being addressed by the recent open API initiatives from the largest players in the smart phone and tablet markets - Apple, Google and Samsung. In 2014 Apple launched their HomeKit initiative for home control device interoperability and NEST launched their Works With NEST program. Samsung purchased SmartThings to be the hub of app interoperability for their product line and GE purchased Wink to be their smart home hub.

However, in our experience we have found that while our clients think they would like to have whole house automation scenes – in reality they rarely use these functions over a long period of time. Most often they use one application for a specific task – such as listening to music, turning up or down a thermostat, or arming a security system. The automated scene that starts when you get out of bed, turns on the music, opens the drapes, turns on the lights, and turns up the thermostat sounds wonderful at first - but over time these scenes lose their luster – especially when they get out of sync, they start or stop at the wrong times, or they adversely effect other family members who are in the home.

### Hub Based Solutions

- Apple HomeKit
- GE Wink
- Samsung SmartThings
- SmartThings

### Cloud Based Solutions

- Google Works with Nest
- IFTTT Do
- Yonomi

Additionally, having one application for total home control doesn't really make a lot of sense in a world where all of us are comfortable using many different independent apps for independent purposes. According to Tim Cook, Apple’s CEO, the average iPhone user now has 117 applications on their phone. We use them for email, maps, activity tracking, restaurants, traffic, surfing the web, etc. - so we are already used to having one app perform a specific function. Granted we don’t want 100 home control applications to sift through to open the front door – but if we pick one best of breed application for the home’s primary functions we can keep all of those apps in one easy to find folder and label it home control (for example, please see the cover image of this paper).
As a final point, the definition of the overall scope of automated total home control is not well defined. Commonly one thinks of these automated total home control systems for whole house audio, TV, HVAC, security, and the camera and access systems in the home. And perhaps the pool and hot tub. But how does automated control of irrigation systems fit in? Or health monitoring systems? Or kitchen appliances? As these systems are added to the home network there are separate apps that are needed to control these various platforms and the benefit of a single automated home control application starts to erode. It used to be that all of these subsystems did not have embedded processing intelligence and they had to be managed by a centralized home control server - that is no longer the case. The internet of new things entering the home is exploding at a phenomenal rate (see diagram from Cisco above) and those systems that survive or die will do so on the merits of their platform working well on iOS or Android operating systems - not on their compatibility with a total home control platform.

But it is not all doom and gloom for high end total home control systems. They are and will find success in markets where integrated product platforms need to have one standardized interface to ensure the control experience is easily understood and operated by hundreds if not thousands of individuals in a given location. This environment exists in the corporate boardroom where the platform is defined as an integrated AV control experience, or the hotel or hospital room where the room’s lighting, TV, or HVAC represent a unified control platform experience for employees, guests or patients. These systems are only modified when approved by the corporate IT staff of these organizations. They are tightly controlled to make sure the control experience to the user of the boardroom or the guest of the hotel or patient in the hospital is always the same and works reliably. This model of a total control system for a defined suite of subsystems controlled by many different users is fundamentally different than the individual home where a wide variety of subsystems are used by one family at a time.

The other scenario where a different breed of total home control companies will enjoy success is in the mass market where there is price sensitivity to the high cost of custom integration of premium digital platforms. Companies like AT&T Digital Life Platform, Comcast Xfinity Home Control, Honeywell Home Automation and many others are enjoying success by offering a limited, defined, standardized suite of home subsystems that will have on-going software compatibility with their total home control solutions. These systems are relatively inexpensive, generally require a monthly subscription, and perform basic home control functions well. But they will never be able to offer best of breed premium systems to their clients because their expertise is in the aggregation of control functionality across a limited set of digital product
platforms - not in the enhancement of each of the individual digital platforms. As large as Comcast and AT&T are they are no match for the razor sharp engineering focus of a Sonos or NEST that continues to enhance their respective platforms. Their integrated platform experience will always be a subset of the customized experience provided by dedicated platform companies.

But this is no different than the experience of selecting McDonald’s for dinner versus the high end restaurant in town. One offers a very limited and predictable menu that is inexpensive and serves the needs of the mass market - the other offers an enhanced menu that is customized for the unique tastes of their clients at a much higher price. They both offer a meal as their service and they both succeed in their respective markets. McDonald’s will never be the high restaurant in town nor should the high end restaurant try and cater to the mass market.

The same model applies to the custom electronics integration channel. We serve high end clients that demand from us a customized experience they can never get from a Comcast or AT&T offering. It could be argued that the offerings from Comcast and ATT only enhance our position in the home because they stimulate the demand for home control with their low prices and their mass market advertising. When the customer discovers that their offerings are very limited they will come to the custom integrator to meet their specific needs.

**Summary**

Today’s connected home is far different from the home we lived in just a few decades ago. In the early 1920s and 30s electricity was first installed in homes and it dramatically changed how we enjoyed our homes – this utility enhanced our entertainment, comfort and security. Today’s network connected home, tied to an always on broadband internet connection, dramatically enhances and extends these same services – to anywhere inside or outside our homes. The challenge over the last decade has been to reliably manage and control all of these new services that can enrich our lives. The widespread adoption of smart mobile devices from Apple and Android based companies have given manufacturers of entertainment, comfort, and security systems the ubiquitous interface that makes it much more intuitive for homeowners to manage, control and enjoy the full, rich range of capabilities of these subsystems. Total home touchscreen based control was traditionally available in the form of expensive total home control processing equipment, custom touch screens, and custom programming for a finite set of supported manufacturers. Today almost any manufacturer can update their product with network connectivity and write an easy-to-use iOS or Android software application to control their product – they only have to ensure compatibility with an IP based home network and the Apple and Android operating systems and they can place the control of their product into the hands of hundreds of millions of homeowners. From thermostats to garage doors to door locks to pool/hot tub controls – this trend towards product intelligence, network connectivity, and iOS and Android control is rapidly changing the landscape of how we enjoy and control our homes. These systems, when properly designed and integrated into the home, will forever enhance the way we live, work, play, and learn - as they do for the Smith Family in the following case study.
Day in the Life of the Smith Family in Their Smart Connected Home

In this demo case study we will bring mobile connectivity to life – showcasing examples of how an iOS enabled home enriches the daily life for a couple named Don and Barbara Smith.

Friday begins early at 6AM the Smith residence with the soft music of James Taylor coming from the Apple Watch that is charging at the head of the bed. Don reaches over to turn off the Apple Watch alarm and reaches for his iPad Mini to open up the Lutron application to draw back the motorized curtains and turn on the bathroom lights. He gets up to shave and turns on the iPad mounted next to the bathroom mirror to launch the TiVO application that streams live news TV coverage of the weather, stock, and traffic information for the day.

His wife Barbara wakes up to go the kitchen to make herself a cup of coffee and pauses in the hallway to open the Sonos application on the mini iPad mounted in the kitchen cradle to play Smooth Jazz music from the integrated hidden wall speakers in the kitchen. She loves the premium Pandora smooth jazz internet streaming service – it’s always on at the touch of a button and never plays advertisements. Barbara then goes into the family room where she starts her morning workout using a DVD video from Jillian Michaels. She picks up the iPad in the family room and launches the Roomie Remote application to turn on the TV, the receiver, and the DVD player – all with the touch of a single button labeled “Play DVD”. She adjusts the volume up of the workout DVD with the physical volume button located on the side of the iPad.
As Don leaves his home to go to work he can’t remember whether he closed the garage door so he reaches for iPhone and launches the Liftmaster MyQ application which shows him that the garage door was still left open – he taps the garage door icon and the door closes. Back at home, when Barbara completes her workout she opens up another application on the family room iPad which will turn on the home’s hot water recirculating pump – so that when she starts her shower in a few minutes it will immediately have hot water. Barbara loves this application - it saves water and energy from not having to keep the hot water recirculating pump on all day.

As Barbara drives off to attend a school board meeting she realizes that she forgot to set the home security alarm the home on her way out. She reaches for her Apple Watch and launches the Alarm.com application to set the house alarm. In her rush to leave for her meeting Barbara remembered that she left the home heating system on so she launches the NEST thermostat application on her Apple Watch and reduces the temperature of the home from 74 degrees to 50.

Don is now in the office and after his morning staff meeting and he gets a ring on his iPhone that someone is at his home’s front door. He launches the Mobotix application on his iPhone and can see that a postman has arrived with a package he needs to deliver. Don tells the postman that he is disabling the home alarm security system and opens up the home front door with the August door lock application from his iPhone so that he can put the package in the front entry room. Impressed, the postman asks Don to give him the phone number of the custom installation company that provided these features – he wants to add them into his own home!

Before heading to her office from the board meeting, Barbara stops for lunch at her favorite delicatessen in town. She has an hour before her next afternoon meeting and she opens up her iPad to launch the TiVo application that recorded and stored the previous evening’s show of 60 Minutes. The iPad has not only become her main home control tablet but now it serves to deliver her TV, music, and movie entertainment when she is on the road.
Don is ready to come home from a difficult week at work and is ready to soak away the stress of the work week in their backyard hot tub. To conserve energy the hot tub has been turned off during the day - but on his way home he turns on the Pentair hot tub control application from his iPhone so that the hot tub is on and heated by the time he arrives. Also, on his commute home he remembers to turn up the NEST thermostat so that the home is comfortable upon his arrival.

Barbara is also heading back home after a day full of meetings - when she pulls into the driveway she notices that the front lawn looks pretty dry. Normally the programmed sprinkler system automatically waters their lawn but the last few days have been warmer than normal. Barbara launches the Rachio irrigation application from her iPhone and selects the front lawn watering zone to manually turn on for the next 15 minutes. In anticipation of guests arriving at their home tonight she opens up the Lutron application to turn on the front and backyard landscaping lights and the Pianodisc application to softly play Norah Jones on the piano in the home’s entry way.

It’s 7:30 PM and Don and Barbara’s friends have arrived to join them for an evening BBQ in the backyard. Don picks up his iPad to open up the Sonos application to stream his favorite Spotify music station in the backyard. The San Francisco 49ers are playing a Friday evening game and their guests are interested in seeing the game. Don mutes the Spotify music from his iPad and launches the TiVo application to start streaming the football game to the iPad from the TiVo in the family room. When they are all about to sit down for dinner, Don pauses the live TV stream on his iPad and they can watch the rest of the football game after dinner from the TiVo connected to the family room TV.
Night falls and as the Smith’s climb into bed after an active week and they can’t remember if they turned off the backyard landscape lights. They pick up the iPad Mini by the bed’s headboard and open up the August door lock application to lock the front door and press the Lutron application to turn off the backyard landscape lights. And while the Smith’s are recharging their batteries with a good night’s sleep – the iOS devices around the home are recharging their batteries to be ready to assist the Smith family for tomorrow’s full day of AV and home control activities.

Note: This Day in the Life Scenario can be experienced in our cyberManor Smart Home Experience Center in Los Gatos, California - or by downloading the cyberManor Smart Home Experience Center app for the iPad at: https://appsto.re/i6Bv2ts
About cyberManor, Inc.

Gordon van Zuiden is the Founder and President of cyberManor (http://www.cybermanor.com/), a full service home technology integrator headquartered in California’s Silicon Valley. With over 15 years of experience in the sale and support of personal computer and networking products to corporate accounts, Gordon founded cyberManor in the summer of 1999, one of the nation’s first custom electronic integrators to focus on IP based technologies for the home. cyberManor’s mission is to design, install, and integrate Internet-empowered home networking solutions that enhance the entertainment, communications, and comfort of their client’s homes.

Mr. van Zuiden’s vision for the digitally connected home has been inspired by discussions with the executive staffs at Sonos, NEST and TiVo, and the insights and wisdom of CEDIA's thought leaders Rich Green, Peter Aylett, Michael Stein, Mat Lindstedt, Dave Pedigo and Michael Heiss.

Mr. van Zuiden served 6 years on CEDIA's Board of Directors (CEDIA represents the Custom Electronics Design and Installation trade) and has served for three years as the co-Dean of CEDIA's Electronic Systems Design Track, developed the certified CEDIA ESD course on Digital Home Electronic Solutions and has consulted on the development of COMPTIA's HTI+ Network Certification program. For over 15 years he has been a columnist on home networking topics for Residential Systems and Electronics House magazines. Mr. van Zuiden has taught courses or been a panelist on Digital Home Entertainment and Networking Solutions at the national trade shows of CES, CEDIA, ehExpo, CEPro Summit, National Kitchen and Bath Association, IEEE, and internationally in Digital Home Expos in Russia, the Netherlands and Mexico over the last decade. He has also been a consultant to industry manufacturers and custom integrators across the United States, teaching full day seminars on the applications and benefits of networked home technologies.

Mr. van Zuiden graduated with a BSME degree from Stanford in 1977 and an MBA from UCLA's Anderson school in 1983.

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Appendix 1 - Best of Breed Phone and Tablet Applications

The following table is a compilation of most of the AV and home control applications that are referenced in this white paper. They have been chosen because of the successful integration experience we have with these products for our clients – and my own home. But this is far from an exhaustive list – in any given system category – entertainment, comfort, and security there are dozens of manufacturers that have iOS and Android based control solutions for their products – and that list is growing daily. The value of the custom electronics integrator will be to choose and integrate these “best of breed” hardware subsystems and iOS and Android applications that will best fit the needs of a given client.

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*Best of Breed System Criteria:* Extremely high product reliability; extensive R&D efforts to maintain a market leadership position; competent, reliable, and responsive technical support team; an ongoing commitment to improve and enhance graphical applications that run on all Apple and Android mobile platforms; a company’s product platform has become an ecosystem for third party products that enhance their product line: a unique offering of entertainment or home control from an iOS or WatchOS product.
Appendix 2

The Apple Watch: Initial Home Control Experiences

I have had my new black sports band Apple Watch for almost a month and have now developed some first impressions on what I think its impact could be on our clients and the custom electronics industry. Unlike the Apple touchscreen products that preceded the watch, the phone and the iPad - the Watch’s immediate role in home control and automation is not nearly as clear. When the iPhone was introduced it was evident to most custom manufacturers in the residential home control space that this platform would have an immediate impact on how customers would want to control their home’s music, televisions, lighting, security systems, and heating and cooling systems. Over time, and with the growth of the Internet of things the iOS and Android smart phones also became a remote control point for sprinkler systems, door locks, and swimming pool and hot tub controls. When the iPad was introduced about three years after the smartphone it was also obvious that this high resolution, large real estate touchscreen could serve as a useful control interface in the home. When you want to see and control multiple home zones, multiple control systems, and add high resolution graphic images the added screen real estate of an iPad becomes very useful. Even the iPad mini found a niche for certain rooms and home control applications.

But the immediate impact of the Apple Watch on home control is not as evident. It is most likely the reason that some large players in our industry are still on the sidelines with respect to their Apple Watch software development. Crestron and Savant are committed to the new platform while we have not seen anything yet from Control4. Sonos and NEST are also conspicuously absent but Lutron does have Apple Watch control. Interestingly enough - when leading companies such as Sonos and NEST don’t provide smart watch control of their products enterprising third party companies are there to sell their Apple Watch control software to fill this void - even if it is a temporary one. ZonePlay and Kronos make a pretty good Apple Watch Sonos controller, NEST App and NestControl make an Apple Watch NEST controller and the Drip app allows you to view your Dropcams on the watch.
One of the key considerations for using the Apple Watch for home and remote control is its usability compared to the smartphone interface. In the smartphone world we can get immediate access to our home control apps by launching one unified home controller app (like Savant, Crestron, or Control4) or by opening a home control folder that contains all the individual home control apps (like Sonos, Lutron, and NEST). We can access these apps quickly and interface with them intuitively. The watch interface needs to have this same (or better) level of interaction with our home systems to be useful over the long term.

A key software feature of the Apple Watch OS that provides a level of seamless interaction for the control of home systems is a feature called Glances. With Glances you can easily sweep away the clock interface of the watch to view your front door camera, one more swipe and you can arm or disarm the home, one more swipe and you can control the Sonos whole house music system, and one more swipe lets you control your Apple TV. These swipe actions are very easy and intuitive to learn and invoke - Watch apps that support glances are great candidates for home control - those that do not are much more limiting. The problem is that opening an app on an Apple Watch requires a level of precision finger pointing in order to launch a very small app icon. If you miss the app you launch the wrong one. In addition the watch screen can become quickly crowded with app icons making them difficult to find. You can’t create folders for home control apps on the watch screen interface (but you can move them together to find them a little more easily).

My strong suggestion to our clients and custom integrators that are beginning to deploy Apple Watch home control is to select the top 4 or 5 control features you want to deploy and include them in the glance-able screens of the watch. All other secondary control features should be left as watch applications.

There is another factor that has inhibited our industry’s rapid embrace of the Apple Watch for control as well - specifically that most apps on the watch need to be wirelessly tethered to a nearby iPhone and the apps generally do not run that fast on the Watch. But that promises to change this fall as Apple recently announced at the Developer Conference that the new Watch OS2 operating system will allow developers to write apps that can run native on the watch without the use of the phone - and run much more quickly.

I predict that many hardware manufacturers that have not yet released a watch app will do so when Watch OS2 is available. And just as each iOS release gave clients a richer smartphone experience expect the same in the smart watch space. The Watch app wave will also continue to build momentum. When Apple first introduced the Watch they announced there were over 3000 apps already written for the watch. A few months later that number has crossed over 5000 - expect that by the end of the year this number will be over 10,000. Of those apps many will be in the home control space. (For a great overview of all the home control apps now available for the Apple Watch you please visit www.watchaware.com).
It’s also important to note that the watch has some very unique experiences that will find their way into the home control experience. Haptic response is one of those experiences - if you forget to arm your home when you leave or close the garage door your Watch will vibrate on your wrist with this reminder. Siri and voice control will become a more important feature for home control. As products begin to roll out under the Apple HomeKit umbrella we can expect to see the Siri voice functionality of the Watch enable commands such as turning on and off lights or opening and closing door locks. As the Watch apps embrace location awareness expect their usefulness to increase as well. Imagine walking into a Sonos audio zone where the Watch knows that you are in the kitchen zone and you can immediately bring up the kitchen Sonos audio interface on your watch to adjust the volume and music content in this room - no more fumbling through rooms to figure out which one you are in.

Finally we need to understand how the Watch is beginning to replace the keys and wallet in your pocket. If we use its near field and bluetooth communications capability for financial payments (Apple Pay) and to open locked doors in our home, car, or even hotel rooms, then the watch will become a much more useful device on our wrist. And the more we use it for payment and key functions - the more we are likely to use it for home control functionality.

The Apple Watch will clearly have an impact on our clients and the custom electronics industry - but unlike the smart phone and tablet devices it will take some time before it becomes as ubiquitous as these devices are now for home control. But Apple will keep improving this platform, manufacturers will keep improving their watch software, and consumers will become increasingly comfortable with this new touchscreen interface. We sell custom integrated and control solutions to our clients - and the Apple Watch will become part of that solution.