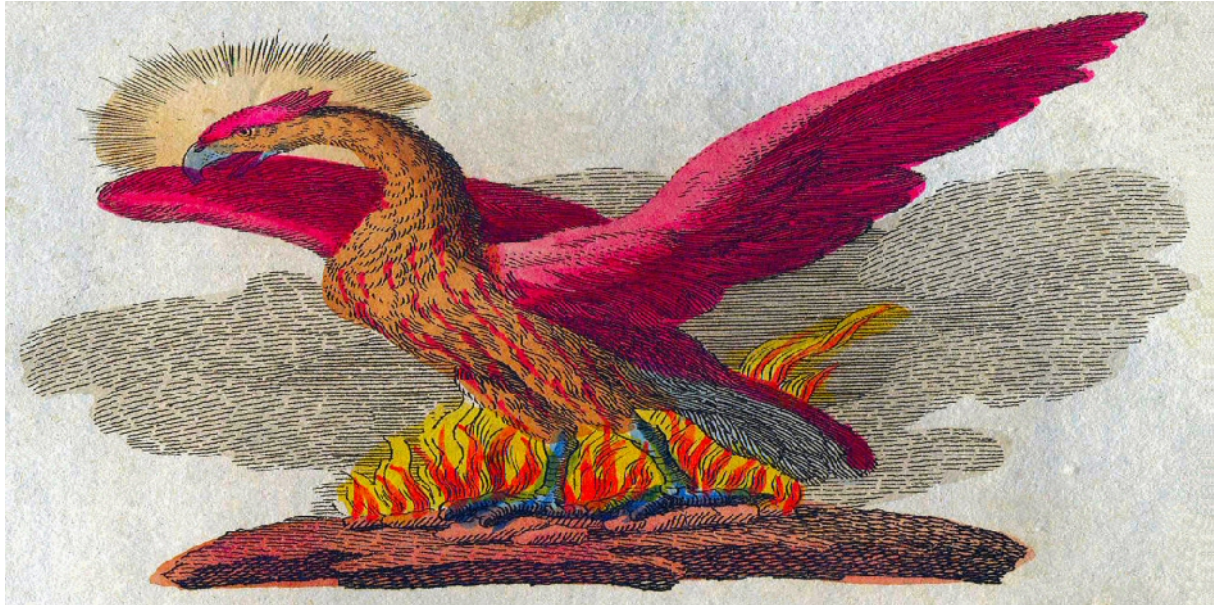


# Vertu: Could it rise again?

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*Could Vertu rise again, like a phoenix from its ashes?*

This essay explores, from a largely technological perspective, how Vertu, a manufacturer of luxury handmade mobile-phones and smart-phones that went out of business in 2017, could possibly be re-invented in the future. As part of that exploration it seemed both reasonable and necessary to speculate on why Vertu may have had to cease its manufacturing operations; primarily to give some relevance and context to that exploration. Such speculation is not intended to cast Vertu in any sort of negative light, because all sorts of businesses fail all the time, for all sorts of reasons, most of which are beyond control and therefore avoidance. The purpose of my speculation was to simply consider, in a respectful and non-critical manner, one possible reason, the extenuating circumstances, so to speak, why that situation may have arisen in Vertu's case, and how a different technological approach to its particular line-of-business might be able to help it avoid a repeat of such a situation if it were ever to be re-launched in the future. For clarity, speculation is not fact, it is nothing more than guesswork largely in the absence of fact, and it should always be treated as such. I do not have any special inside knowledge of Vertu. I was never an employee of Vertu. I am not a spokesperson for Vertu. I hold no vested interest in Vertu. I would, however, like to see Vertu try again, as I really like the idea of technology that is designed to last a long time, because so much of our modern world seems to be based on technology that becomes obsolete after a surprisingly short period of time, such as smart-phones with their two-year upgrade cycle, which I think is an incredibly wasteful use of non-renewable raw materials and energy, and a non-trivial source of environmental waste and greenhouse gas emissions.

So, I have a pet theory<sup>1</sup> that one of the reasons that Vertu's manufacturing operation went out of business was that the world of personal communications had changed so much over the last 10 years of Vertu's life that it was unable to keep up with the pace of that change, and was, consequently, unable to offer ALL the technological features and functionalities that its increasingly tech-savvy customers wanted from their personal communications devices. Of course, I do not know for sure if my theory is correct or not, that is why I am presenting it as a theory and not a factual account, but it seems reasonable that it is valid to some degree, even if it is only a very small degree. Other technology businesses, including Nokia, which gave birth to Vertu, struggled with the consequences of those exact same changes, becoming mere shadows of their former selves in the process, so why not Vertu. I believe that some valuable lessons can be learnt from this theory, such that if Vertu were to be re-launched in the future that it would be possible to ensure that it did not fail again for the same reason. It should be noted that my theory relates to just one possible reason why Vertu may have failed, and there could easily have been many others, as business failures rarely have just a single cause.

My theory assumes that Vertu was actually-trying-to-keep-up with the changes that were going on in the world of personal communications in the first place, because there is a very real possibility that Vertu was purposefully-not-trying-to-keep-up, or was only-selectively-trying-to-keep-up. Why? Because Vertu did not make mobile-phones or smart-phones, it made "personal communication instruments", which were, fundamentally, whatever Vertu defined them to be. So, if Vertu didn't want to keep them up to date, or only wanted to keep them selectively up to date, then that was simply the way Vertu wanted to run its business. Whether Vertu was actually-trying-to-keep-up with all the latest developments in personal communications devices, or not, we will (*probably*) never know for sure. However, it seems reasonable to assume that Vertu was actually-trying-to-keep-up, because that would have been something that was likely to have been important to its customers, and ultimately Vertu wanted to not just please its customers, but to delight them in every possible way, which is exactly what luxury brands typically try to do. On the other hand, Vertu may have been purposefully-not-trying-to-keep-up, in which case my theory is fundamentally incorrect, and the cause of Vertu's failure lies elsewhere. It should, however, be noted that even if my theory is wrong that my suggested approach for a re-launched Vertu could still have some merit.

Vertu was a retailer of luxury handmade mobile-phones and smart-phones, which it referred to as "personal communication instruments". Vertu's instruments were handcrafted at its factory<sup>2</sup> in Church Crookham, Hampshire, United Kingdom from prestige materials, such as diamond, sapphire, ruby, stainless steel, titanium, gold, platinum, and the finest-hide leathers, and came with a 24-month warranty as standard. Vertu's instruments were, accordingly, very expensive. In 2017, prices ranged from US\$5,600 for the Onyx Calf<sup>3</sup> from its Aster Collection to US\$46,600 for the Clous de Paris

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<sup>1</sup> An idea used to account for a situation or justify a course of action.

<sup>2</sup> <https://www.google.com.sg/maps/place/Vertu/@51.2577583,-0.8270947,17z/data=!4m5!3m4!1s0x48742c0d8da85677:0x24801288ae6e8157!8m2!3d51.257755!4d-0.824906>

<sup>3</sup> <http://www.vertu.com/us/en/collections/aster/shop-collection/onyx-calf/600386-001-01.html?cgid=13500>  
(Please note: this link no longer works, but it did in the past)

Red Gold<sup>4</sup> from its Signature Collection. More expensive instruments could be created on a bespoke basis, if required. Vertu also sold a range of luxury accessories, including instrument cases made out of exotic leathers, as well as cables, an external battery pack, headphones, pens, replacement batteries, travel chargers, a wireless charging pad, and a wireless speaker. The internals of Vertu's instruments were upgradeable, allowing, to a certain extent, the technological features and functionalities of its instruments to be kept up to date. Owners of a Vertu instrument were able to take advantage of Vertu Concierge, which provided a wide range of services, including help with travel arrangements, hotel bookings, restaurant reservations, entertainment tickets, and emergency assistance, which were available day and night from pretty much any location in the world. Vertu was not the only retailer of luxury mobile-phones, and its competitors included Goldvish<sup>5</sup>, Gresso<sup>6</sup>, and Mobiado<sup>7</sup>.

Vertu was founded in 1998, as a subsidiary business venture of Nokia<sup>8</sup>, a Finland-based mobile-phone manufacturer. This was the same year that Nokia overtook its rival, Motorola<sup>9</sup>, to become the world's best-selling mobile-phone brand. Vertu officially launched<sup>10</sup> in early 2002 with a prestigious event held at the Musée d'Art Moderne de la Ville de Paris<sup>11</sup> in Paris, France. Ten years later, in 2012, Nokia sold 90 percent of Vertu to the EQT VI fund managed by EQT Partners<sup>12</sup>, a Sweden-based private equity group, whilst retaining ownership of the remaining 10 percent. The sale (*probably*) said more about the business difficulties that Nokia was experiencing at that time than it did about Vertu, which seemed to have become a firmly established fixture on the luxury goods scene. In 2015, EQT Partners sold its Vertu holdings to Godin Holdings<sup>13</sup>, a Hong Kong-based holding company. It appears that Nokia also sold its remaining 10 percent stake in Vertu to Godin Holdings at this time<sup>14</sup>. When Vertu was sold to Godin Holdings it was reported in the press that Vertu had, to that date, sold approximately 400,000 products<sup>15</sup>. In early 2017, Godin Holdings sold Vertu to Baferton<sup>16</sup>, a Cyprus-based private investment company. By the middle of 2017, Baferton announced that Vertu's manufacturing operation in the United Kingdom, which employed nearly 200 people, would be wound up. Media reports suggested that Vertu had debts of over \$100 million<sup>17</sup>. Vertu's other operations were unaffected. At the time of its closure, Vertu

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<sup>4</sup> <http://www.vertu.com/us/en/collections/signature/shop-collection/clous-de-paris-red-gold/602646-001-01.html?cgid=12500> (*Please note: this link no longer works, but it did in the past*)

<sup>5</sup> <https://en.wikipedia.org/wiki/Goldvish>

<sup>6</sup> [https://en.wikipedia.org/wiki/Gresso\\_\(company\)](https://en.wikipedia.org/wiki/Gresso_(company))

<sup>7</sup> <https://www.mobiado.com/>

<sup>8</sup> <https://en.wikipedia.org/wiki/Nokia>

<sup>9</sup> <https://en.wikipedia.org/wiki/Motorola>

<sup>10</sup> [https://www.nokia.com/en\\_int/news/releases/2002/01/21/vertu-launches-the-worlds-most-exclusive-instrument-for-personal-communication](https://www.nokia.com/en_int/news/releases/2002/01/21/vertu-launches-the-worlds-most-exclusive-instrument-for-personal-communication)

<sup>11</sup> <http://www.mam.paris.fr/en>

<sup>12</sup> [https://en.wikipedia.org/wiki/EQT\\_Partners](https://en.wikipedia.org/wiki/EQT_Partners)

<sup>13</sup> <http://godinsec.com/> (see <https://www.engadget.com/2015/11/03/vertu-sold-to-chinese-company-godin/> for an explanation)

<sup>14</sup> <http://nokiamob.net/2017/03/15/vertu-sold-again-now-in-hands-of-turkish-businessman/>

<sup>15</sup> <https://www.luxurysociety.com/en/articles/2015/09/in-conversation-with-massimiliano-pogliani-ceo-vertu/>

<sup>16</sup> <http://www.baferton.com/> (*Please note: this link no longer works, but it did in the past*)

<sup>17</sup> <http://www.telegraph.co.uk/business/2017/07/11/vertu-manufacturing-arm-faces-liquidation-rescue-bid-fails/>

instruments and accessories were available from a worldwide network of approximately 500 retailers, of which approximately 70 were directly run by Vertu<sup>18</sup>. Baferton has retained the brand and its underlying technologies, so there is a very real possibility that Vertu will be reincarnated at some point in the future, like some fabulously-bejewelled phoenix<sup>19</sup> rising from its ashes.

Vertu was born during a period of relative, and I stress the word 'relative', technological stability, certainly in terms of the mobile-phone industry, which was, or so it seemed at the time, to be battling more on the basis of form (*e.g., bar-phone, flip-phone, slider-phone*) than on function, but was then caught out when that stability was thrown on its head by mobile-phones evolving into smart-phones, and was not able to keep pace with the smart-phone's rapid evolution into the wondrous portable personal computing device that it is today. When Vertu was originally launched the mobile-phone<sup>20</sup> (*now more commonly referred to as a feature-phone*<sup>21</sup>) was the predominant personal communications device, and Vertu definitely knew how to make a luxury mobile-phone, because that was its whole purpose in life; why it had been created by Nokia, its *raison d'être*. Mobile-phone functionality was relatively stable, and relatively simple; basically just voice calls, text messages, monochrome display screen, camera, and a few simple applications, such as a contact list, calendar, calculator, and maybe a simple game or two. So, it was relatively easy for Vertu to create a luxury mobile-phone, even if it took them a little while to do so, because the features and functionalities of a typical mobile-phone were unlikely to have changed very much whilst Vertu was busy constructing that luxury version, which ensured that the final result would be fully-acceptable, not only as a luxury object but also as a perfectly-useable personal communications device, and any minor deficiency in features or functionalities, such as a missing bell or whistle, should that ever occur, could be easily overlooked, because so many other aspects of the device, particularly its physical aspects, were of superlative quality. However, when the simple mobile-phone started to evolve into the far more complicated smart-phone (*i.e., a pocket-sized general-purpose personal computing device*) it became much more difficult for Vertu to make a luxury version before the technological features and functionalities of a typical smart-phone had significantly changed<sup>22</sup>. This was because the design of a typical smart-phone was in a state of almost constant flux, with features and functionalities being added, updated, or removed on what seemed to be an almost daily basis. Obviously, I exaggerate a little here, but I am sure you get the picture; smart-phones were evolving rapidly, and this made it very difficult, if not impossible, for Vertu to consistently offer instruments with the latest and greatest technological features and functionalities, which many, if not most, of its customers (*probably*) expected to be included as standard in such premium devices. Vertu was, essentially, whether it would admit it or not, playing a never-ending game of catch-up with the likes of Apple<sup>23</sup> and

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<sup>18</sup> <https://en.wikipedia.org/wiki/Vertu>

<sup>19</sup> [https://en.wikipedia.org/wiki/Phoenix\\_\(mythology\)](https://en.wikipedia.org/wiki/Phoenix_(mythology))

<sup>20</sup> [https://en.wikipedia.org/wiki/Mobile\\_phone](https://en.wikipedia.org/wiki/Mobile_phone)

<sup>21</sup> [https://en.wikipedia.org/wiki/Feature\\_phone](https://en.wikipedia.org/wiki/Feature_phone)

<sup>22</sup> A modern smart-phone can take between 12 and 24 months to develop, and obtain all necessary regulatory approvals on a global basis, so even if Vertu's development time was on the low end of this range, it would still take them 12 months to develop a new instrument, and the technological features and functionalities of a typical smart-phone could have changed substantially within that time.

<sup>23</sup> [https://en.wikipedia.org/wiki/Apple\\_Inc.](https://en.wikipedia.org/wiki/Apple_Inc.)

Samsung<sup>24</sup>, the companies that now set the bulk of the smart-phone technological-agenda. *Remember, this is all just a theory, and not proven fact.*

At the beginning of its life, when Vertu was a subsidiary of Nokia, it was part of a company that was a leading innovator in the mobile-phone industry. Vertu was able to leverage the knowledge and technologies of its parent and ensure that its instruments consistently offered leading edge, or near leading edge, features and functionalities. Unfortunately, in the years leading up to 2012, Nokia steadily lost its position as the leader of that industry, which, consequently, distanced Vertu (*to some degree*) from that leading edge, making it harder (*to some degree*) for Vertu to consistently offer the sort of features and functionalities that most people were starting to expect from their smart-phones. Nokia's decline in the mobile-phone/smart-phone market had been primarily due to the increasing popularity of smart-phones based on either Google's Android operating system (*which was available to anyone*) or Apple's iOS operating system (*which was proprietary to Apple*), at a time when Nokia's smart-phones were (*initially*) based on its own Symbian operating system, and (*later*) on Microsoft's Windows Phone operating system. Vertu also used the Symbian operating system for a number of years, before switching to Android. So, when Vertu was sold, for the first time, in 2012, it became, in my opinion, even further distanced from that leading edge, and two further sales, one in 2015, and another in 2017, (*probably*) did not help matters. Of course, I am sure that with or without Nokia that Vertu was very much the captain of its own ship, and took appropriate action in a timely fashion to keep technologically abreast in its market as best it could, but, still, trying to play catch up with the likes of Apple and Samsung, without the close-assistance of an industry heavyweight, like its original parent, must have been challenging.

In the end it seemed that Vertu was selling a premium-priced smart-phone that had been finely-crafted from the most-luxurious of materials, but was not able to consistently offer correspondingly premium technological features and functionalities, which was something, I am guessing, that even the rich of this world could not easily overlook, regardless of just how many diamonds, sapphires, or rubies adorned a typical Vertu instrument, or how helpful the Vertu Concierge service actually was. So, I believe that whilst many rich people genuinely wanted to own one of Vertu's luxurious instruments, because those instruments had become, over the years, instantly recognisable symbols of success and wealth, the simple fact that those instruments were not as capable in some way, shape, or form, as a device costing a fraction of the price from Apple or Samsung may very well have prevented them from doing so, with the result that they (*probably*) decided to buy a flagship device from Apple or Samsung, and then spend the rest of their riches on other luxuries, of which there seems to be an almost endless supply in this world.

Now, if Vertu is ever going to restart its luxury smart-phone business (*remember: Bafteron retained the brand and its underlying technologies*) then it will need to find a way to permanently avoid becoming technologically out-of-date, and having to play the largely unwinnable game of catch-up. I believe that there is really only one solution to this problem, because Vertu will (*probably*) never lead the smart-phone industry and set

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<sup>24</sup> [https://en.wikipedia.org/wiki/Samsung\\_Electronics](https://en.wikipedia.org/wiki/Samsung_Electronics)

its technological agenda, and will, consequently, (*probably*) always lag, to some greater or lesser degree, behind its technological leading edge. That solution is for Vertu instruments to become thin clients<sup>25</sup>, but before I get into that, I think it may be worthwhile to explain, very briefly, why I think Vertu's previous approach to this problem is (*probably*) no longer viable.

Previously, Vertu's solution<sup>26</sup> to the problem of outdated internals was to regularly offer new, updated, internals, a solution that was, in many ways, a Sisyphean feat without end (*i.e., the endless game of technological catch-up*), and an approach that would (*probably*) not allow a Vertu instrument to be viable in perpetuity, which is something that I think most of Vertu's customers believed, at some level at least, was essential in a device that can cost more than many people's car. This approach seemed to require three things; one, that Vertu would trade in perpetuity, two, that Vertu would create replacement internals for all its instruments in perpetuity, and, three, that Vertu's customers would regularly purchase new internals in perpetuity. This all seems like a tall order, and even if Vertu could trade and create replacement internals forever that many of its customers would eventually tire of continually buying such replacements. The incredible power of hindsight also tells us that this approach will not work because the Vertu (*manufacturing*) business has already been shutdown (*i.e., it was not able to trade in perpetuity*), which makes the two other requirements somewhat difficult, if not impossible, to achieve. An alternative approach might be for Vertu to partner with a company that specialises in manufacturing smart-phones, such as Foxconn<sup>27</sup>, which is a Taiwanese contract manufacturer that has in the past created premium electronic devices (*e.g., e-readers, games consoles, smart-phones, and tablet computers*) for a wide range of high-profile companies, including Amazon, Apple, BlackBerry, Microsoft, Nintendo, Nokia, and Sony, or with one of the very many Chinese smart-phone manufacturers that now exist. Such an approach would (*probably*) bring Vertu a little closer to technology's leading edge, but perhaps not close enough to truly satisfy its technologically-discerning customers, because a third-party manufacturer is still not Apple or Samsung, even if that manufacturer currently works for one of those companies on a contract basis, and the latest and greatest smart-phone features and functionalities that most people now want will always be the intellectual property of some other company and not the third-party manufacturer. Vertu would also lose some degree of control over a key differentiating aspect of its instruments, namely its internals, which were, apparently, as finely crafted as its cases. Another approach might be for Vertu to give up making its own internals altogether and just produce luxury replacement cases for Apple or Samsung smart-phones, as per some of its competitors. The problem with such an approach is that Vertu would, again, lose control of a key market differentiator, as it would have no say in the design of Apple's or Samsung's smart-phone internals, which it then simply encased. Also, there could be no certainty that the physical dimensions of Apple's or Samsung's smart-phone internals would not change on such a regular basis that it would create a whole new set of problems for Vertu, such as having to continually design and build new cases, which would mean that instead of playing its usual game of technological catch-up it would then be playing

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<sup>25</sup> [https://en.wikipedia.org/wiki/Thin\\_client](https://en.wikipedia.org/wiki/Thin_client)

<sup>26</sup> This was Vertu's "Evolutionary Technology" concept.

<sup>27</sup> <https://en.wikipedia.org/wiki/Foxconn>



form-factor catch-up instead.

So, this brings me back to thin clients. What I envision is that Vertu's instruments will become, effectively, interactive televisions, and the 'broadcast' channels that those 'televisions' will then be used to access will provide all required personal computing functionality on a fully-interactive basis. These channels will be provided by remotely-located cloud computing-based data centres (*i.e., the Nearby Cloud<sup>SM</sup>*) that communicate with Vertu's instruments using real-time communications protocols carried over next-generation mobile communications networks. These channels could be maintained long into the future, directly by Vertu if necessary, in order to ensure that its instruments worked in perpetuity. In some ways, such channels could be thought of as being 'digital peers' to the analogue Vertu Concierge service.

So what exactly is a thin client? In my book, **The STREAM TONE: The Future of Personal Computing?**, I introduced a concept known as the Stream Tone, which is a new technology ecosystem designed to enable a streaming-oriented approach to personal computing, and which is exactly what Vertu would need in order to turn its instruments into thin clients. The Stream Tone is comprised of a thin client-based access device, a real-time communications protocol, service infrastructures, and telecommunications infrastructures. I described thin clients in the following way:

*A thin client is a low-performance computer terminal specifically designed for a single purpose; accessing a remotely-located, generally high-performance, computer server, over a computer network, such as a local area network, wide area network, or the Internet. The amount of [data] processing that takes place on the client terminal, compared to on the server, can vary, dependent on the client-server implementation, but in general terms, a thin client can do little more than present the output of its associated server and send user-input back. Modern server output can include both audio and video data, whilst server input, sent from the thin client, can include data from keyboards, multi-button pointing devices, [touch devices,] and even third-party computer peripherals connected via USB interface. Thin clients communicate with their associated servers using real-time communications protocols, of which there are many; both free and open-source software-based and proprietary. The thin client user-experience can be identical to a purely localised personal computing solution, with desktop operating systems and software applications visually presented as if executed on a local personal computing device, and user interaction, via devices such as [touch-screen], keyboard, and mouse, remaining unchanged. The use of thin clients greatly simplifies operational activity by consolidating systems maintenance and systems security onto the server, instead of across multiple personal computing devices. One of the earliest thin clients was the video, or dumb, terminal that was used to access mainframe computer-based services using serial communications. The video terminal was a very simple personal computing device that was designed to receive and display alphanumeric data sent from the mainframe computer, and to send keyboard-input back. Its hardware was sufficient to do its simple job and no more. The video terminal did not have any off-line storage, or an operating system, and was therefore unable to directly run any [user-space] software applications. All applications needed to be run on the mainframe computer, which was controlled via commands typed on the*

*keyboard of the video terminal. Most modern thin clients are still simple, low-performance, personal computing devices, but unlike their video terminal forefathers, they often run a basic operating system, and are able to execute simple, manufacturer-supplied, software applications that are primarily designed for accessing their associated server over a computer network. The simple hardware and software needed to build a thin client ensures that it is affordable, power-efficient, and reliable, when compared to a more traditional personal computing device, such as desktop or laptop computer. Attempts to make thin clients more affordable, power-efficient, and reliable has seen the creation of ultra-thin clients and zero clients, which are more like the old-fashioned video terminals, in that they have no operating system, and all their functionality has been implemented in hardware, generally via a system on a chip built using application-specific integrated circuit or field-programmable gate array technology. Without access to a server, a thin client is largely useless, and for this reason the thin client servers are designed to be highly reliable in order to minimise any unwanted downtime, something that could adversely impact a large number of users. Thin client functionality can also be implemented in software, permitting server access from a traditional personal computing device. (Source: The STREAM TONE: The Future of Personal Computing? © Copyright T. Gilling. All rights reserved.)*

What makes thin client technology such a good fit for the internals of a Vertu instrument is that, in simple terms, the hardware and software of a thin client never needs to change. It supports standard communications interfaces, such as Bluetooth, Ethernet, Universal Serial Bus, and Wi-Fi, and as long it can exchange data, in a supported format, with a suitable computer server over those interfaces, it should be able to work (*possibly*) forever, without any need for any type of alteration to its hardware or software. This is exactly how a typical television is able to remain viable as an entertainment device for many decades; it has a relatively simple function (*i.e., audio-visual presentation*) and works using remotely-supplied data (*i.e., a broadcast channel*) that is communicated over standardised interfaces (*i.e., radio waves*). If more, or different, data processing is required by a thin client in order to provide a particular (*software-based*) feature or functionality then it can be obtained by simply upgrading the remotely-located computer servers that are used to provide that feature or functionality, and not by upgrading the thin client. Of course, unlike a more traditional thin client that is comprised of just a simple input device, such as a keyboard, and a simple output device, such as a display screen, a thin client-based Vertu instrument would also need to include all the sensors and interfaces typically found on a modern flagship smart-phone, such as an accelerometer, ambient light sensor, barometer, Bluetooth interface, Global Navigation Satellite System, gyroscope, image sensor(s), loudspeaker(s), magnetometer, memory card reader, microphone, mobile communications interface, Near-Field Communication interface, proximity sensor, touch-sensitive display screen, Universal Serial Bus interface, and Wi-Fi interface, to name but a few. The data generated by these sensors and interfaces would, in most instances, only be lightly processed by the Vertu instrument, using hardware-based logic, in order to capture, filter, and package that data ready for transmission to remotely-located computer servers for final data processing.

So, a thin client-based Vertu instrument would become out-of-date far slower than a typical fat client (*i.e., a normal smart-phone with local data processing capabilities*),



because a fat client is always going to be primarily defined by its local data processing capabilities, capabilities that cannot be easily upgraded as they are (*typically*) a fundamental, and therefore a (*typically*) unalterable, aspect of such a client, whereas a thin client is primarily defined by its non-local data processing capabilities provided by its associated remotely-located computer servers. As users expect more and more from their fat clients (*i.e., their smart-phones*) there will inevitably come a point in time when the data processing capabilities of those fat clients will be deemed to be insufficient and must be replaced by more powerful fat clients (*i.e., the next flagship smart-phones*), and this will be true even if those fat clients included all required sensors and interfaces. In contrast, the remotely-located computer servers that support thin clients can be easily upgraded, and can, consequently, offer ever-increasing data processing capabilities, without any need to replace, or even alter, the thin client that receives the results of those increased data processing capabilities. So, by basing the electronic internals of a Vertu instrument on thin client technology far greater hardware stability can be obtained, which should completely remove, or if not completely remove then greatly reduce, the need for Vertu to continually play technological catch-up. This approach makes sense for two key reasons; one, the bulk of the smart-phone hardware platform has finally started to stabilise (*i.e., smart-phones now have an increasingly-standardised set of sensors and interfaces*), and, two, most newly required features and functionalities are purely software based (*e.g., social networking services, or clever artificial intelligence-based data processing*), which can, in the vast majority of cases, be easily implemented on a thin client's remote servers.

In specific terms of stability, the capabilities of smart-phone screens (*i.e., a type of interface*), cameras (*i.e., a type of sensor*), and communications (*i.e., another type of interface*), to take three good examples, will soon reach a level that is considered to be more-than-sufficient (*i.e., good enough*) for most uses, accompanied by a general realisation that even higher resolution display screens, cameras, and even higher communications bandwidths are just not necessary for most typical use-cases. At which point the smart-phone will have finally reached its zenith, such that smart-phone display screens will have a resolution of, say, 3840 pixels by 2160 pixels<sup>28</sup> with high dynamic range, and a high refresh rate, smart-phone cameras will have a resolution of, say, 33 megapixels, or 7680 pixels by 4320 pixels<sup>29</sup>, with high dynamic range and excellent low-light capabilities, and smart-phone communications will use bandwidths of over 1 gigabit per second<sup>30</sup> when stationary, and over 100 megabits per second when in motion, and which will be reliably-available from everywhere, whether on land, at sea, or in the air.

So, if a re-launched Vertu were to build a thin client-based instrument with such capabilities it is not hard to imagine that such an instrument would not become obsolete (*i.e., unusable*) for many, many years, if at all. Of course, there could always be an unforeseen change in something fundamental that threatens obsolescence, such as a change in global communications protocols or radio frequencies, comparable to the

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<sup>28</sup> Also known as 4K Ultra High Definition (UHD).

<sup>29</sup> Also known as 8K Ultra High Definition (UHD).

<sup>30</sup> Even though a FHD HDR video stream at 30FPS will only require a bandwidth of approximately 3 megabits per second, and an 8K UHD HDR video stream at 60 FPS will only require a bandwidth of approximately 96 megabits per second, using next-generation video codecs, such as AV1, Daala, H.265, or VP9.

quite extraordinary change from analogue to digital television that occurred over the last decade, but this could be handled using future-proofing technologies, such as software-defined radios, field-programmable gate arrays, or modular designs. Obviously, using thin client technology is not a magic bullet, it cannot totally future-proof a Vertu instrument, but it can, potentially, greatly extend its useful lifetime, and by so doing, allow Vertu to update the technological internals of its instruments at quite substantial time intervals (*e.g., multiple decades*).

Now, having said all that, if smart-phones evolve into devices for augmented<sup>31</sup> or virtual<sup>32</sup> reality then perhaps they will have moved too far for a luxury version to make any sense, especially given that such devices are expected to become more like an elegant pair of spectacles than a rectangular ‘slab of chocolate’, and such a minimalistic form factor may just not have sufficient real estate for Vertu’s particular take on luxury, well not unless you want to look like Elton John at his most glam-rock<sup>33</sup>. Personally, I don’t think that that will be the case, because there is still a lot of life left in the current smart-phone form factor, which will, consequently, remain popular for many years to come, ensuring that if Vertu wants to try its luck again with another tastefully jewel-encrusted rectangle then it can. In fact, the greatly enhanced technical stability offered by a thin client-based platform may also allow Vertu to branch out with a whole new set of long-lived heirloom-worthy products, such as smart-watches and tablet computers.

Now, as mentioned earlier, just turning a Vertu instrument into a thin client is not the only change that will be required in order to greatly extend its working life, because a thin client needs a technological ecosystem in which to operate. Such an ecosystem may naturally become available in the future, or it may need to be specifically created and maintained by Vertu in order to ensure the long-term viability of its instruments. If Vertu created such an ecosystem itself, it might find that it is much easier to do than it first appears<sup>34</sup>. Also, it could be highly lucrative, because customer access to such an ecosystem would almost certainly have to be subscription-based, which would then give Vertu a nice recurring-income stream. This ecosystem would be, essentially, the Stream Tone concept that I described in my previously-mentioned book. It will need service infrastructures (*i.e., remotely-located cloud computing-based data centres*) to provide all required personal computing functionality, and a real-time communications protocol (*e.g., perhaps something based on the WebRTC protocol*) to communicate that functionality over telecommunications infrastructures (*i.e., the Internet and the last-mile*) to the thin client-based Vertu instrument. An effective ecosystem will need to provide Internet connectivity that is highly affordable, high bandwidth, low latency, highly reliable, and ubiquitously available. Characteristics that are easy enough, with the exception of ubiquitous availability, to provide using a wired connection to the Internet (*e.g., using optical fibre or the latest generations of coaxial cable or copper wire-based communications*), but which are very much harder to provide wirelessly (*i.e., using mobile communications*). Luckily, next-generation mobile communications, starting with Fifth-Generation Mobile Communications (5G), are expected to bring all such capabilities

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<sup>31</sup> [https://en.wikipedia.org/wiki/Augmented\\_reality](https://en.wikipedia.org/wiki/Augmented_reality)

<sup>32</sup> [https://en.wikipedia.org/wiki/Virtual\\_reality](https://en.wikipedia.org/wiki/Virtual_reality)

<sup>33</sup> [https://en.wikipedia.org/wiki/Elton\\_John#/media/File:Elton\\_john\\_cher\\_show\\_1975.JPG](https://en.wikipedia.org/wiki/Elton_John#/media/File:Elton_john_cher_show_1975.JPG)

<sup>34</sup> Relatively speaking.

to the world, possibly as soon as 2020, and definitely by 2025. This streaming-oriented approach to personal computing, which is basically what underpins this thin client-based approach, will need vast amounts of mobile data, certainly far more than the handful of gigabytes that most mobile Internet service providers currently offer. In fact, it will need terabytes of downloaded mobile data per month, an amount of mobile data that today, in 2018, would be prohibitively expensive, but by 2025 should be quite affordable<sup>35</sup>. In fact, I believe that by 2025 we will have ‘effectively’ unlimited monthly mobile data download allowances (*i.e., fixed-price unmetered mobile Internet access*) as standard, because we will no longer be charged by the amount of data that we download each month but by the bandwidth of our mobile Internet connection, with higher bandwidths supporting high-resolution services (*e.g., continuously streamed UHD video*), and lower bandwidths supporting low-resolution services (*e.g., continuously streamed SD video*). Internet service providers will still be able to charge more for more, but instead of that being more mobile data, it will be more mobile bandwidth. Why will this happen? Primarily because of the unprecedented (*i.e., as in, never seen before*) capabilities of next-generation mobile communications, which will finally allow us to turn our world into the bright and shiny science fiction future that we have long been promised, but which has, to date, remained frustratingly just out of reach. *Please see my essay on Why Our Digital Future Needs Unlimited Data for more information on bandwidth-based pricing.*

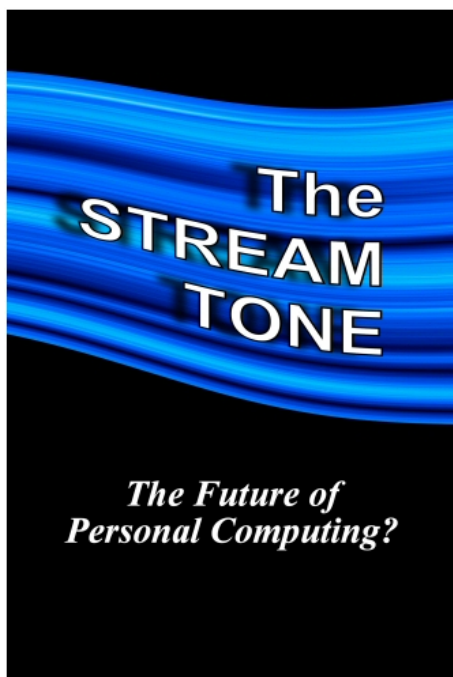
So, to conclude... Vertu launched at a time when the design of the mobile-phone was relatively simple, and relatively stable, and it was, consequently, relatively easy for Vertu to create a luxury version. The evolution of the mobile-phone into the smart-phone replaced that simplicity and stability with complexity and almost constant change, which made, in my opinion, Vertu’s on-going attempts at making a luxury smart-phone (*personal communication instrument*), with all the latest technological features and functionalities, increasingly difficult. If Vertu is to ever re-launch itself then it must find a way to ensure that its instruments are always technologically up to date, or to side-step this challenge altogether. Unless Vertu becomes the world’s leading smart-phone innovator, something that is very unlikely, it will be impossible for it to keep its instruments up to date in perpetuity. Turning its instruments into something that looks and feels exactly like a smart-phone but isn’t (*i.e., a thin client*) would seem to be a very clever solution to an apparently intractable problem. Of course, it would need a supporting ecosystem, which sounds challenging until you realise that next-generation mobile communications promise to be highly affordable, high bandwidth, low latency, highly reliable, and ubiquitously available, and could arrive as soon as 2020, cloud computing-based data centres can already supply all required personal computing functionality, there are several real-time communications protocols already available that could potentially be used for communicating such functionality, and, of course, we already have the Internet. So, if a re-launched Vertu wanted to build a luxury thin client that looks and feels exactly like a smart-phone, or some other type of smart-device, then it could (*probably*) do so with great ease. Will it? Who knows? However, if Vertu truly is the phoenix that I think it is, it will surely rise again at some point in the future, and then we will all find out.

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<sup>35</sup> I expect terabytes of downloaded mobile data to eventually cost pennies per month.

# The STREAM TONE: *The Future of Personal Computing?*

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*Imagine... a world where your next personal computing device is the last one that you would ever need to buy. Where you would never need to worry about operating systems, software patches, or viruses. Where you always had enough processing power, memory, storage, and top-of-the-line graphics. Where you could access all of the very best software applications, regardless of their platform. Where you had a constant connection to all your favourite digital services, and your battery lasted for days, perhaps even weeks, of full-on use. Sounds good, doesn't it? Well, this is the world of the Stream Tone. A world that does not exist in some far off future; this could be, figuratively speaking, our world a mere five minutes from now. All that is needed to make it a reality is the creative convergence of certain technologies that are already available and in use today.*

**The STREAM TONE: *The Future of Personal Computing?***

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Personal computing is changing from an old world of local services, provided by local devices, to a new world of remote Web-based services, provided by cloud computing-based data centres. **The STREAM TONE: *The Future of Personal Computing?*** is a 408-page academically-oriented non-fiction book that explores, in considerable technical detail, what might be required to make a comprehensive move to this exciting new world, and the many benefits that move could bring. This book not only attempts to make a thorough evaluation of the technology ecosystem that will be required to create this future but also considers many of the implications of such a move. Along the way, it also discusses a wide range of currently-available technologies and how they could possibly be used to enable this future.

**Supporting materials (errata, hyperlink-extract, etc.) now available**

**For further information please visit: [www.TheStreamTone.com](http://www.TheStreamTone.com)**

