

The Story Behind My IP

by Thomas Walker Lynch
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Preface

I am the inventor or co-inventor on the 190 entries that come up in the following Google patent search.

<https://patents.google.com/?q=-US2705417A&q=-DE2228595A1&inventor=Thomas+W.+Lynch&dups=language>

With few exceptions my patents followed from work product, not the other way around. I am first and foremost an engineer. I built heat sinks before filing patents on them. I built circuits before filing circuit patents. I was doing VLSI design for specific microprocessor products before filing micro-architecture patents on those designs. I had some patents for a native K7 from AMD that did not get built because of the company changed plans, but at the time there were specifications, Gantt charts, and my team, including myself, were already working on the design. A number of my telecom patents came from my startup 21st Century Telephone. Although that product did not see the light of day, we were writing code and working towards a product before those patents were filed. A number of those patents are now represented in products.

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Introduction

We all know that innovation is what has made the difference between our ancestors living in caves and chasing their dinner, and our playing video games at home in an air conditioned house while ordering in pizza. However, the difficulty is that none of us can know for sure which inventions being proposed today will find value in the market tomorrow, and due to resource constraints we may only chose to pursue a subset of the proposals.

Opposing forces shape the business of innovation. On the one hand, companies are highly motivated to demonstrate shareholder value through innovation. Consequently there is a lot of competition in this space and players do not always play fair. On the other hand we have a diametrically opposed force. Innovation makes many people uncomfortable, particularly those who are already successful. Not everything an inventor comes up with works out, and people can fail to understand even good proposals. Hence, a favorite social tool among those who oppose innovation is to ridicule the inventor. In this essay I discuss some of this.

I have been fortunate that my intellectual property portfolio has aged well. I have managed to participate in a number of technology trends over the past few decades, but in looking back, at any moment it could have been very different. For example, had my IP lawyer Bruce Garlick not have done such fantastic work much of the 21st Century Telephone material would never have been purchased. Due to changes in patent laws and trends in startup funding I am watching as my second generation material might in fact suffer the fate of not making it to market due to lack of investment.

This article was originally on linkedin. If you are interested in seeing the comments section there:

<https://www.linkedin.com/pulse/story-behind-my-ip-thomas-walker-lynch>

21st Century Telephone

This was one of three startups I did in Austin. When Dave Reed started bragging about his success investing in cell phone towers, I concluded that cell phones were 'here to stay'. I saw that it would not take long for cell phones to collide with portable computers, so I came up with a product I called the *Dragonfly*, which was both a computer and a cell phone. It became clear that this new hardware opened up an opportunity to think differently about information, so I also came up with quite a few new information management concepts.

I took the business plan to Bobby Inman. He liked the idea of a computer telephone enough to send me to pitch it to Charles J. Roesslein at Southwestern Bell. Charlie brought a SWB tech expert with him to the meeting so as to gauge the feasibility. However, instead of gauging the feasibility, this expert evaluated the vision. This is a classic fallacy with a predictable outcome. The tech expert said that the future was in switch technology not in smart phones. How convenient, that was his department and he had active proposals open. Also noteworthy, Stephan Strauss at Austin Ventures passed on the product concept. He did not even want to see the pitch. I tried so many times that I think he started avoiding me. Compounding this, I made a rookie mistake by assuming that a seasoned marketing person was not going to join the team because I had not heard from him in a while, and I replaced him. It turned out that the man was doing a serious study of the business plan and was left bewildered. I truly regret not having spoken with him first.

Startups are built around faith in the vision, and when that faith is lost the startup can tumble down like a house of cards. Our technical expert had been introduced to me as a person who was unstable but brilliant. The former quality was why he was available. This proved to be an accurate assessment. One day he up and sided with the naysayers, and declared that the idea of using the telephone network along with the Internet (see 2FA just below) was actually ridiculous. He left the project taking the code with him. It was very dramatic. Apparently he shared his opinion about that concept with Scott Adams as it soon after appeared in a Dilbert cartoon where the pointy haired boss had this stupid idea of combining telephony with the Internet. The new marketing person had been introduced to me as a person leaving a bad divorce and wanting to live in Austin. Scatological analogies often seemed to be just under the surface so I was not surprised when she

suggested a motto for the product that had the acronym B.S. Hmm. Then the real shark smelled something in the water. My own ex wife declared she would destroy me in retribution for having divorced her- though she had been the one who first asked for it. (Local corrupt practitioners piled onto that business opportunity, so I studied them. Let me know if you want to see that document. It is enlightening. That study contributed to later proposals.) Really I should have just gone drinking with our new marketing person.

In that environment it was not possible to pitch 21st Century Telephone as a startup any further. Fortunately the one person with a clear enough vision to continue was the IP lawyer, and thus I was happily thrust into the business of selling IP. Much of my IP went on the market shortly after Nathan Myhrvold started Intellectual Ventures. Along with some other inventors I met the man at an IV meeting in Austin. He mostly talked about cooking. He would later write a cookbook. He did buy some IP from me.

2FA

The Dragon fly was intended to leverage multiple networks for increased security and bandwidth. The basic idea being that it would be more difficult for an attacker to listen on two separate networks. Hence we were able to make use of this to securely move bulk data over the least expensive, or most conveniently available, channel. Today this technique has become what we call 2FA. As mentioned it was not popular with the pointy haired boss, and frankly today I don't really like it either. I prefer a hardware key.

System and method for supporting multimedia communications upon a dynamically configured member network
<https://patents.google.com/patent/US6487600B1/en>

Symbiosis

This is one of my favorite portfolios and was an IV purchase. It creates the information equivalent of quantum entanglement. Here multiple computers have some quantum state in common, and other state that is not in common. Where 'quantum state' can be interpreted directly as digital data, or it may be a function of such data. This can then be used to achieve a number of interesting security properties. This approach later appeared

in bitcoin with its multiple identical ledgers on many machines. I suppose only Satoshi knows if my Symbiosis work was integrated as part of the bitcoin algorithm, or if this is a coincidence. Either way, it is kind of cool to have a patent on something that went into the bitcoin algorithm.

Maintaining coherency in a symbiotic computing system and method of operation thereof

<https://patents.google.com/patent/US7593989B2/en>

Symbiotic computing system and method of operation therefor

<https://patents.google.com/patent/US7593989B2/en>

Symbiotic network digital document layering and/or steganography method, article and apparatus

<https://patents.google.com/patent/US20090260061A1/en>

(I see this was abandoned, which is interesting as it combines with the Digital Rights Management Technology)

System and method for supporting multimedia communications upon a dynamically configured member network

<https://patents.google.com/patent/US6487600B1/en>

Maintaining coherency in a symbiotic computing system and method of operation thereof

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Digital Rights Management

I created three solutions to this problem. The first one was a set of modifications to the file system so that creators would be able to make their DRM info available directly to the OS. The OS would then be able to treat it appropriately. This is sort of like having another access mode, where as currently there is read, write, and execute, we add a fourth, being 'read and respect *this* license'. This approach goes a long way at improving the situation. Then imagine DRM material has watermarks, and combine that with the symbiosis stenography IP, and we can raise this to a new level. This brings us to the second solution of tracking transnational artifacts. This leads to a very sophisticated means of knowing where DRM goes and if we even want to do business with a peer. In the simplest form this presages

the advent of tracking cookies. The distinct third solution is to create dedicated hardware paths between devices, where the transfer of data on these paths is reduced to the problem of control commands. Software applications simply get no say in the matter of copying the material.

Network resource access control methods and systems using transactional artifacts

<https://patents.google.com/patent/US9438595B2/en>

Protected intra-system interconnect for digital rights management in electrical computers and digital data processing systems

<https://patents.google.com/patent/US8302200B2/en>

Validation of protected intra-system interconnects for digital rights management in electrical computers and digital data processing systems

<https://patents.google.com/patent/US8291501B2/en>

File accessing and retrieval using soft digital rights management technology

<https://patents.google.com/patent/US20090126027A1/en>

(This is the file system approach, filed by Rambus, sold to a broker, and now appears to be abandoned. No one ever discussed it with me after it was initially drafted. It might not have been well understood or not appropriately placed.)

A Layer Over the Top

The idea here is that we have software layered over the top of our usual browsing on the Internet. With this software we may capture what we see on our screen or browser and then save it, share it with others, or discuss it in a different forum. It lets us make an Internet about the Internet. In spirit this is related to the Symbiosis technology. With Symbiosis, information about what is on computers is exchanged between computers to achieve security objectives. This is then one of the interpretations for the 'function of such data'. This invention is represented in Microsoft Edge, which provides a mode whereby users may mark up websites.

Object annotation

<https://patents.google.com/patent/US8924844B2/en>

This technique is variously called a virtual Internet or a meta Internet. I made a larger portfolio built around it. However, no one expressed interest in the work so I was pulled into other projects.

Relationship Rings

Relationship rings was the wayward child among the 21st Century Telephone IP, probably not because of the topic, but because of the buyer. I was introduced to Guy at Transpacific as a person who would be able to sell him IP. He asked me for a proposal, and I sent Relationship Rings. He was dissatisfied. He complained that it made no sense, and that he wanted something more “like other IP”. He hated the name “Relationship Rings” so in most places I changed it to R-smart for ‘right brain smart’, because it was a scheme to organization information based on emotional intelligence rather than analytical intelligence. I tried to explain that it was like friendship rings, or mood rings. I pointed out that friends and fraternities sometimes share rings, in an analogous manner as to how they would be brought together by this software. Due to the ex’s never ending post divorce actions I didn’t have latitude to negotiate, as the lawyers needed to be paid or I wouldn’t see my kid, and due to Guy’s unhappiness he did not offer much for it.

The following information comes second hand from two people. One inside of Transpacific, and one associated with them. Their stories match, so I am going to reproduce it here. Apparently Google then purchased the IP from Transpacific for 7 figures and Guy was so happy with the deal he often bragged to people about it. (I hope he did as well with the other IP he bought from me at fire sale prices.) But this was not the end of the story for Relationship Rings. As per any wayward child, of course there must be more.

After the intellectual property reached Google my ‘friendship rings’ concept was apparently changed to ‘circles of friends’. One of their CTOs seemed to be rather concerned by my IP. It must have had priority dates on something, as he then wrote a *book* explaining how he had invented Google Circles. Apparently life is all about circles of friends. I guess this is why we file patents. The filings are there for anyone to lookup. Shortly afterward this CTO left Google and joined Facebook. Well perhaps this is another case of great minds thinking alike.

Now about the Rings technology itself, it is based on the observation that information which is used on a computerized cell phone would be of a different nature from that which I would run across in my engineering work. Namely it would be more personal. I created a technique whereby information, data, and even call priorities are organized based on the relationships among the people communicating.

R-smart person-centric networking

<https://patents.google.com/patent/JP5247810B2/en>

<https://patents.google.com/patent/WO2009061494A1/en>

Associating data with R-smart criteria

<https://patents.google.com/patent/JP5107434B2/en>

<https://patents.google.com/patent/WO2009061460A1/en>

Managing communications on an r-smart network

<https://patents.google.com/patent/JP5107434B2/en>

<https://patents.google.com/patent/WO2009061460A1/en>

Controlling access to an r-smart network

<https://patents.google.com/patent/JP2011503697A/en>

<https://patents.google.com/patent/WO2009061459A1/en>

Managing data on a person-centric network using right brain smartness criteria

<https://patents.google.com/patent/JP2011503699A/en>

<https://patents.google.com/patent/WO2009061461A1/en>

Google Circles is no longer a product offered by Google, and I am not surprised given that they left out so much of the vision for the product. It is unfortunate that Google did not talk with me as I could have explained the vision further, and I even have second generation technology. As this is no longer a Google product I am not surprised that the portfolio has not been kept up to date. In the list above I show the Japanese filings as those are still active. In China it is still pending, but the US filings are listed as abandoned. It is also possible that this portfolio has fallen victim of changes in the US patent laws. The various nations are attempting to unify their systems and the US has been adopting a stance towards software patents that more resembles the European system where they are not allowed.

Well in the least, my two contacts have given us a good story.

Herd Technology

This was one of the later social media related applications related to the 21st Century Telephone startup. The concept was built around the idea of a herd of animals, with an alpha leader and followers. The name is also a cute double entendre. Instead of a *relationship ring* it is a *relationship pyramid*. Accordingly, anyone may attempt to be a herd leader and gather herd follows. The herd leader will then send message to the followers. I saw that it would be useful for marketing especially when campaigns made use of charismatic figures. In some of my explanations of the technology I used Britney Spears as an example herd leader who sent out spurious fashion tips or gossip to her teenage followers. I was asked to explain it repeatedly at IV, a total of 5 times, including to Bill Mangione-Smith and Howard Skaist, I also pitched it to Gene McCabe an east coast investor. No one bought the IP. There was a silicon valley startup that was looking for a pivot at the time. It sure looks like they picked it up. If anyone knows the rest of that story, I sure would like to hear it. Of course, I would like credit for my work. Without such credit how can I convincingly speak to investors for funding for other startup projects? I also have second generation technology for this space, in case someone is interested.

Computer Architecture

I was a member of the Advanced Architecture Development Department at AMD, the telecommunications group, and in a third design group that concentrated on x86 architecture chips (though that function would later collide with the first group). In the Advanced Architecture Development Department most of my work was related to floating-point units. Some of my designs were patented.

Reconfigurable Data Path

A floating-point unit consists of a number of separate hardware sub units, and data must be routed between these in order to accomplish executing a single instruction. For example, a subtract operation might cancel upper bits, and thus the result might require a left alignment shift, whereas the addition of two magnitudes will not require this step.

Many x86 floating-point instructions invoke nano-code sequences. As processor designers we have complete control of the nanocode. Hence, I created an unconventional pipeline whereby instructions sharing the floating-point unit would not have to block due to false dependencies in sub-operations such as an alignment shift.

Rapid pipeline control using a control word and a steering word
<https://patents.google.com/patent/US5930492A/en>

Here each instruction arrives at the floating-point unit with a control word and a steering word. These are used on a cycle by cycle basis to steer the data through the floating-point unit while providing control bits to each sub unit. One instruction might even pass another. This existed at a layer below the super scalar architecture.

Daresay, Dave Witt did not comprehend my explanation of it, and the design did not reach the die. Dirk Meyers also made hay on this telling me that another person would take over that part of the design, “and she is a woman”. Ah, gee thanks for the explanation of the meaning of pronouns Dirk. I am not sure why he thought I would care if a man or woman worked on the floating-point unit. He also ridiculed me for using a hyphen before my name when signing notes. This was only the tip of the iceberg with the social-technical dynamics at AMD. Working at AMD could truly be miserable at times. However, later Dirk would become the CEO of the company, so perhaps there is something to this sort of thing.

The technique of configuring the data path to create instructions that streamed without blocking generalized and proved to have important applications in other chips. For example, the telecom group wondered if perhaps there was something we could do to create a hybrid general processor and DSP. I think one of the most important architecture techniques among those in this section was done along with John Bartkowiak. The concept here is to connect the bus up between ALU units so as to support higher level DSP algorithms. (There are a number of related patents on the Google list.)

A processor having a bus interconnect which is dynamically reconfigurable in response to an instruction field
<https://patents.google.com/patent/US5771362A/en>

At the startup Quicksilver Technologies I created the architecture and cycle simulator for a radio front end processor. I found a nice technique using two dimensional microcode to get the necessary performance and efficiency of running the front end filter algorithms while still supporting general purpose programming on the same hardware. The first level of microcode configured the bus for streaming to create the fundamental instructions, say for example an instruction for a series of multiply-adds for a FIR filter, or alternatively of an add followed by an alignment shift for a subtract. The second layer of microcode then played the traditional role of providing control signals for executing said instructions. I wonder if perhaps the control word and steering word would have been a better approach, but AMD had the patent on that.

This approach of wiring up a paths through data units is a nice compromise between conventional processing and that of fully reconfigurable computing. This is because it makes use of buses and switches that would have to be present during conventional computing anyway, and thus does not incur the expense of adding a full layer of switching fabric.

I tried to convince Quicksilver to file some IP on this, but they were too busy bailing water out of the boat. I was rather proud of the architecture, so after the Quicksilver startup sank, and I found myself looking for another position, I described the two dimensional microcode on my resume, of course. Today this concept of programming a data path is fairly common and may be found on NVidia processors and in places such as Google's Tensor Flow. (Yes I interviewed with NVidia. At the time their architect was talking about implementing x86 on a graphics processor. And no, Google did not talk with me. They did not even send me a T-shirt for solving their nth prime in e problem and the following question, then logging into the linux server account. That still irks me a bit, so I added that solution to my resume also - LOL)

Also Among My Computer Architecture Inventions

Data cache and method using a stack memory for storing stack data separate from cache line storage

<https://patents.google.com/patent/US5930820A/en>

Interface for coupling a floating point unit to a reorder buffer

<https://patents.google.com/patent/US5887185A/en>

Assembly queue for a floating point unit

<https://patents.google.com/patent/US5828873A/en>

Piping rounding mode bits with floating point instructions to eliminate serialization

<https://patents.google.com/patent/US6233672B1/en>

Tagging floating point values for rapid detection of special floating point numbers

<https://patents.google.com/patent/US6009511A/en>

Hierarchical microcode implementation of floating point instructions for a microprocessor

<https://patents.google.com/patent/US5859998A/en>

The following came out of the 29050 chip project. As can be seen in the next section, I mostly did micro architecture on this project, i.e. the top level design of specific functional units (as well as some logic design and circuit design). However I was present and participated at the initial meetings where we decided how to organize the unit. I also proposed recycling denormal results, something that others at the meeting then made work on the white board. The other proposal which would have been accepted would be to do like Alpha later did and to just flush to zero. Perhaps my biggest architectural contribution is not a patent, but rather the proofs I did to make Dave Witt's proposal of pipeline pre-detection for errors work. These formal proofs showed the technique was practical, and provided the tests and constants that were needed. I then became one of the proponents for formal verification at AMD.

Normalizing floating point processing unit

<https://patents.google.com/patent/US5058048A/en>

Pipelined floating point processing unit

<https://patents.google.com/patent/US5053631A/en>

Micro Architecture Inventions

For the Am29050 I came up with the fastest known adder configuration for the given technology node. This would be published in the IEEE Transactions on Computers, and lead to my masters thesis at UT Austin where I showed a solution to the unsolved discrete optimization problem for carry skip adders (whoo-who LOL).

Ripple carry shifter in a floating point arithmetic unit of a microprocessor

<https://patents.google.com/patent/US5901076A/en>

High speed mixed radix adders

<https://patents.google.com/patent/EP0450752B1/en>

Radix 4 carry lookahead trees

<https://patents.google.com/patent/EP0450755B1/en>

<https://patents.google.com/patent/JPH0773019A/en>

I came up with a fast SRT divide configuration that was unique in that it used a very fast algorithm that in rare cases would get the wrong answer, but then correct for it. An iteration was so fast that Salim Shah and I was able to get the circuit design down to the point where the divider could be double pumped per clock cycle.

High speed divider with square root capability

<https://patents.google.com/patent/EP0450754B1/en>

<https://patents.google.com/patent/US5128891A/en>

High speed dividers

<https://patents.google.com/patent/EP0450751B1/en>

<https://patents.google.com/patent/US5128891A/en>

Carry save adders for high speed iterative division

<https://patents.google.com/patent/EP0450751B1/en>

<https://patents.google.com/patent/US5206828A/en>

It kind of looks like Intel made use of the patent sharing agreement they had with AMD and made use of the design on a Pentium chip. However, in the patent I did not include the post fix-up step because the patent was for something else and I had no idea someone would use it verbatim. I would have told them about had someone asked. (If you know any more about this anecdote I would like to hear about it.)

The Heat Sinks

These heat sinks take up entirely too much space in the Google search results. There was mainly one successful heat sink, and that has applications in many countries and apparently was split, forked, and continued. I built prototype equipment even before graduating from engineering school. I also studied thermodynamics and material science. However, being that I did computer design as an occupation I was a bit surprised to be asked to develop some heat sink designs, and I said as much. The customer suggested, 'why not try?' so I did ,and produced three. This is the successful one:

Double bonded heat dissipation

<https://patents.google.com/patent/US8018722B2/en>

The other two reticulated heat sinks are beautiful. The second version with flow cooling even looks like a brain. I did build a prototype and they work. However they have been abandoned by the buyer. This might be because these require components to be tape mounted, or the like, rather than being board mounted, and most of the industry is not setup to do this. Put charitably, perhaps these were simply before their time.

Heat dissipation system and related method

<https://patents.google.com/patent/US7706144B2/en>

(Abandoned, perhaps filed before its time.)

Reticulated heat dissipation with coolant

<https://patents.google.com/patent/US20090165996A1/en>

(Abandoned, perhaps filed before its time.)

Afterward

Much of the material in this essay comes from startups I worked on. I also have some active projects and proposals that are not reviewed in this document, see:

<https://www.linkedin.com/pulse/projects-search-investment-thomas-walker-lynch/>

And I have some academic publications that are also not reviewed here:

<https://www.linkedin.com/pulse/story-behind-my-ip-thomas-walker-lynch>

Most all of the items discussed here come from the Google search:

<https://patents.google.com/?q=-US2705417A&q=-DE2228595A1&inventor=Thomas+W.+Lynch&dups=language>

The nice part of an organic list coming directly from Google is that it is objective testament. The bad thing is that there is no context given, and it is hard weed out the multiple international filings, continuations, and the occasional splits or redrafts done by the IP lawyers. This essay clears up these issues and gives the reader a glimpse into the innovation business while doing so.

Patents were not filed on everything. Also the patent process is latent and slow, so though filing dates might be more recent the work listed here comes from the mid 1980s to the early 2000s. All these listings were sold or assigned to companies through contracts. There is another document with my newer more available material. Unless this essay explicitly explains otherwise, the patents discussed here are either still active or remained active until expiring. Typically the many international filings are not given. If desired they can be found easily enough in the information at the links. There were a few patents in the gray area where the patent expired about the same time fees were due, and in those cases I used my best judgment as to include them or not, and where possible I clarified by listing an active international filing.

After a patent has been sold the buyer does not always get back to me to explain what he or she did with it. Patents are often licensed in bundles, so it is sometimes not clear which among the bundle played a role. No buyer has ever come to me to ask for further product development. Perhaps I should be humbled by this, but it doesn't really make sense because some of these portfolios have done very well. Could it be that the broker has been adding a clause to prevent this? In addition very seldom does a lawyer talk with me before replying to an office action. For some patents I only know their story due employees using them and getting back to me. Or

in other cases, for example the integration of one of my inventions in the bitcoin algorithm, I am left guessing after seeing it show up in a product. In this latter case, might I suggest that in the least it shows that great minds think alike?