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Original URL: http://www.channelregister.co.uk/2007/06/26/psion_special/

Psion: the last computer

Secrets of the Sony we never had

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Posted in PC Builder, 26th June 2007 09:58 GMT

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Special Feature The Series 5 pocket computer from Psion was launched 10 years ago this week. It was a remarkable achievement: entirely new silicon, a new operating system, middleware stack and applications were developed from scratch in just over two years.

This was the last time anyone undertook such a daunting task: it may be the last time anyone ever tries, either. Companies or projects that are formed to achieve simply one of these four goals typically end in failure: to achieve all four successfully, and put them in a product that was successful, too, was a triumph of creativity and management.

We now live in a world where our general-purpose computers are created from generic, off-the-shelf components. New technology systems take the form of mass market appliances, such as the TomTom navigation system, or the iPod music player. The "Protea" project, as it was called, now seems destined to be remembered as the last time anyone will create, from the ground-up, a new general-purpose computer.

As we discovered, however, this story is about much more than the life of a product. It's about the fate of a once-inventive and fearless computer company. Twice, Psion launched products into the teeth of a recession, products that defied accepted technical limitations and market wisdom to become success stories.

But just as it had with PDAs, the Psion Group also made plans to develop GPS navigation systems, hard-disk based music players, digital radios, and even set-top boxes — long before these markets existed.

Today, the people who drew up those plans at Psion now underpin successful businesses in the very fields Psion rejected. In four years, Psion's former hardware chief turned a tiny Dutch software company into the leader in SatNav systems: TomTom this year will generate $2bn in turnover, using a core of former Psion staff, and led by the computer division's former managing director Harold Goddijn, and its star sales chief, Corinne Vigreux.

And the Psion engineer who eight years ago scouted component factories in England with a dream of making a hard disk-based MP3 player, today heads the engineering for Apple's iPod division. The only one of these consumer electronics products to make it to market was a DAB Radio. While smaller than satnav and portable music, the digital radio market is expected to be worth $1bn next year.

So Psion had the chance to become something few imagine was ever possible: a home-grown consumer electronics giant with a global brand: a British Sony, or a British General Electrics.

Today, seven years from its bloody retreat from the consumer business, Psion is a larger business than it was in its apparent heyday, and is growing at a clip. But little of this is based on technology developed by itself: most of it was acquired with the purchase of Teklogix during the telecoms boom. Psion's lasting legacy has been to provide the core component for a 125 million smartphone market. Few people today would bet against this component — a sophisticated and resilient operating system developed in two years by a small team led by Colly Myers — to be the most used piece of system software in the world. That's no mean achievement and, of course, it's Psion's "genetic legacy", as Potter proudly calls it.

Meanwhile, former Psion staff ponder a list of "couldas" that never had a chance of being "shouldas": projects that never reached the market, that were success stories for other people.

Engineers often make such retrospective claims — but on closer examination, the company lacks the skill, design, or marketing experience to turn a bright idea into a successful product. However, in Psion's case, these claims have much merit, as the company had these skills in abundance. Mark Gretton, at TomTom, and David Tupman at Apple, each oversees the engineering for a hugely successful consumer product. In each case, success was achieved on a budget, compared to some of the more recent big budget consumer electronics projects — think PlayStation 3. Psion even turned down pleas to acquire its eventual nemesis in the PDA business, Palm (a story not recorded in Palm's biography).

Many of the stories here are being told for the first time — and as they unravel, we can ask why Britain had a consumer electronics giant that never was.

Why not?

I've tried to answer the question in three parts. A look at the Protea project — which produced the Series 5 and gives an insight into Psion's skills. Then we pick up the story after the launch of the computer, up to Psion's exit from the consumer electronics business after 18 years, in 2001. Finally the key figures tell the story in their own words.

It's the longest story we've ever run at *The Register* — we'll be making a PDF version (and of course, an Epoc Word format version) available shortly.

Navigation

The Protea Story

After Protea: Psion from 1997 to 2001

In their own words: Mark Gretton; Martin Riddiford; Nick Healey; David Tupman; Sir David Potter;

The Protea Story

When Psion embarked on "the last computer" in 1994, it was riding high. As the Protea project got underway, the company had two successful products — the Organizer II and the Series 3a handhelds — under its belt, and looked set to exploit the 16-bit architecture of the Series 3 for a good few years.

However, the team was uneasy.

"No one could say how long the Series 3a would sell for. It was an uncomfortable time for us at Psion — it was possible that the Newton would take over the market, or perhaps the next HP palmtop, or something rumoured to be coming from Microsoft," says Nick Healey, who became the user interface lead for the project, and who oversaw the applications development.

Apple's Newton MessagePad, announced in 1991 and introduced the year before, had given the world the term "personal digital assistant", but little more. While it was hugely inventive — with new 32-bit silicon from a joint venture with Acorn and VLSI called ARM, and a clever object-based development environment — it was expensive, unreliable and was quickly ridiculed. The first MessagePad was a huge flop. Psion knew the feeling, having had a near-death experience of its own.

Today, Mark Gretton, Psion's silicon guru, describes Psion's MC series range of laptops as "completely insane… you couldn't get away with that now".

Psion had begun investing heavily in designing its own silicon. "David Potter had a belief that real computer companies design their own chips," says one former Psion project manager. "It was incredibly expensive to design your own ASICs, but it could pay off." The catastrophic MC laptop was proof. The new 16-bit architecture Gretton had created, along with the team's experience went into creating the Series 3 in 1991, which put the company back on track.

So Psion knew better than anyone that it couldn't afford to be complacent. Twice in Psion's history, the second iteration of a product was the winner — and Apple had the resources to come back swinging. As it turned out, however, the Apple of 1994 had other things to worry about.

Yet today, the decision to move to an entirely new 32-bit architecture looks vindicated. The operating system, now called Symbian OS, ships in more than 100 different phone models, generating the company that develops and licenses the software around $40m a quarter. More than 125 million units have been bought over the years, and of all intellectual assets created by Psion during its consumer hardware era, the Symbian OS is the only one that today generates new revenue.

"We were very upfront," says Healey. "We said we wanted this to last 10 years."

As it had before, when it moved from 8-bit to 16-bit, Psion was making a clean break with the past. Protea — named after a South African flower — wouldn't be backward compatible with the Series 3. CEO David Potter and his technical team felt there were too many compromises in maintaining compatibility with an old architecture. And they felt more confident than before, thanks to a far-sighted decision taken in 1986. Psion's Organiser II had shipped with a BASIC-like database language that proved popular with users, and Psion had continued to enhance it. Easy tools don't necessarily result in quality software: Apple's Hypercard is a notrious example. But perhaps because of its professional and enthusiastic user base, OPL resulted in a huge range of applications of the highest quality. In an age when we're expected to laud "user-generated content", OPL had enabled a "user-generated software industry" to flourish.

Extreme Engineering

Although his hands-on coding contribution to Protea was relatively small compared to other Psion projects, the influence of Charles Davies on the Series 5 was immense. (For more background on the dynamics at the top of Psion — see the extended piece we'll publish shortly in PDF (and Epoc Word) formats).

Davies was responsible for the ethos of code reuse that outsiders might view as obsessive — but that was instrumental to the company's success.

Davies had been Potter's doctoral student in physics at the University of London, and Psion's first employee in 1980. Davies had written Psion's first commercial hit, a flight simulator game, and he'd subsequently assumed the role of technical visionary, and dispersing the intelligence throughout the company. Having followed up the Sim game with an integrated business suite for the Sinclair QL the following year — in a four-man team that included Colly Myers — Davies knew what office applications had to do. And by the time of Protea, he'd had plenty of time to think about doing them with extreme efficiency.

Time and again, Psion's software proved itself capable of astonishing capabilities with only a minimal footprint. Davies had insisted the 16-bit team use object-oriented techniques — long before the languages or tools for standard 4G object-oriented development were finalised. By the time Protea was underway, aggressive object reuse was deep in the company's development outlook. And for the Series 5, the developers set themselves even more ambitious goals.

Software components were the latest buzzword, as "Web 2.0" is today. Experts predicted that the application would disappear, with users selecting from palettes of functional components. Huge investments went into frameworks such as OpenDoc (backed by IBM, Novell, and Apple) and Microsoft, with its OLE. Byzantine and immensely complicated architectures were devised to implement them.

Since Psion had the opportunity to implement this on a fresh project, it applied its reuse policy from the primitive middleware components right up to the applications. As a result, the Series 5 shipped with a word processor that could also embed sketches and spreadsheets within a document, just like Microsoft with its OLE. It also featured a spell checker, an outliner, and multiple zoom levels. The word processor binary, however, took up just 20kb of ROM space: less than an empty Microsoft Word document — and considerably less than an ASCII file containing the 1,600 page programming guide to Microsoft's OLE.

Psion was justifiably proud of this achievement, and published the source code for the word processor in its Software Development Kits for Epoc.

The last hurrah

Although the Series 5 swelled to more than 100 engineers, many of whom were in their twenties or thirties, the project depended heavily on the influence of leading lights such as Davies, Myers and Gretton.

;The Series 5 really was the last hurrah of the hero engineer," says one Psion project manager. Colly Myers wrote much of the kernel himself for the first year — without a PC backup according to legend. The small kernel team also included Graham Darnell and Jane Sales.
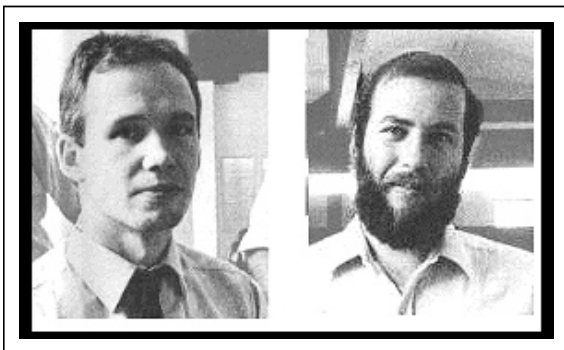
Charles Davies and Colly Myers in 1984

Nick Healey oversaw the applications and UI design, and David Wood the middleware architecture. As Healey says, however, by the time the project started the key figures were so well known to each other, they "interfered" in all parts of the project. Wood ended up training the new recruits by day, rewriting their novice code by night, and sealing the ROMs.

"It was a classic good operating system written with confidence," says Wood now. "We had to do things differently where we saw that there were special needs for a mobile device"

Mark Gretton had devised the first "system on a chip" for a mobile computer for the Series 3a, and set about finding a 32-bit core for its successor, code named Eiger (in our interview he describes how he chose ARM, then a relatively unproven design).

"Martin's a genius at making these crazy mechanisms work."

Martin Riddiford's industrial design company, Therefore, was given the job of putting it all together. Riddiford had never been a Psion employee, but brought a singular talent that engineers loved: improvising impossibly creative mechanical designs.

Riddiford had worked on all Psion's products since the Organiser II, and operated as an independent in what was then a pioneering venture. Psion part-owned the company, had first crack at the designs, but Therefore could work with other clients (except obvious rivals), and keep the IP for designs Psion rejected.

"Martin's a genius at making these crazy mechanisms work. So Martin's job was to figure out the mechanism — and our job was to figure out how to fit everything in," is how David Tupman, now head of engineering for a successful music player, described the relationship. Riddiford created the sliding keyboard for the Series 5, which involved new keyboard IP.

Bill Batchelor and Martin Riddiford in 1997, with the new Psion Series 5

Amid this atmosphere of battling technical intellects, Healey had the job of keeping the user's experience of the final product simple. Many of the design decisions for the Series 5 are so subtle that one only appreciates them when using a handheld or smartphone of today. There was no need for the user to distinguish between RAM and disk. Dialog boxes resembled a flat plane that could be navigated by the arrow keys, rather than voodoo key combinations. Messages were conveyed by subtle and non-intrusive hints, rather than dialog boxes or persistent pop-ups (as on Windows XP), and Healey insisted on plain English throughout.

At one stage, the "Thought Police" team discussed banishing the word "file" from the system entirely. In the end, that was considered a step too far, but the rejection of computer jargon can be seen in the decision to call the database fields "labels", for example.

"Fields are where cows live," says Healey.

Bill Batchelor had the job of co-ordinating the three software projects — kernel, middleware and applications, with Gretton's hardware, and Riddiford's mechanical designs.

(Only Batchelor and Myers declined to be interviewed for this feature. Your reporter's previous interviews with Myers can be found here [2000, 2004 and 2006]. And you can rule out Batchelor as the source for any unattributed quotes in this article. His only words to this reporter, one evening in Cannes several years ago after being introduced by a mutual acquaintance, were the splendidly terse: "I don't know you. I don't trust you. And I'm not going to tell you anything".)

In the end, when the Series 5 finally shipped, it was like being transported into the future, only through a very murky tunnel.

Gretton's hardware clocked in at a meagre-sounding 18Mhz — but performed like a desktop Intel PC from just two years previously — and it could still maintain 30 hours use on two AA batteries. Once the circuitry was complete, the Series 5 performed the same tasks as its Windows CE rivals but used only a quarter of the power.

Applications were ready before the slow LCD screen technology of the day could draw them, and they showed a richness and depth only glimpsed on much more expensive desktop computers.

The most important application, Agenda, was left open-ended. Eccentric users could choose to enter all their tasks and appointments as sketches, for example, or clip-art. More practically, users could drop a to-do list into the day view at a set time, so "Personal" entries appeared at 5pm. No organiser since has quite offered the same flexibility. For Colly Myers, the Series 5 user interface has never been bettered.

But it was Riddiford's touch typing keyboard that came to define the product. The Psion Series 5's keyboard remains the principle reason for the design's enduring utility today. There's still nothing on the market like it.

But people grumbled.

Shadows of Doom

Among the first grumblers were some of Psion's most loyal users.

In the rush to complete the Series 5, features that Series 3 users loved had been omitted. The Series 3 design had its peculiarities, but once these were met, it felt personable, and became an indispensable personal tool. Psion's earlier computers had a diamond or "Psion" key that allowed owners to flick between Agenda views instantly. That had gone. The previous Agenda software had Busy and List views that users found essential, and these were absent too. And with an entirely new platform, it would be some time before Psion's third-party application developers caught up to fill the gap.

Even Martin Riddiford had misgivings.

Looking back now Riddiford says Psion abandoned the Series 3 platform too early.

"They were following a technology trend, leaving behind a really fantastic operating system that fizzled out and died," he tells us. "It could still be relevant today. That's what's so sad."

At least one market indicator suggests he's right. On eBay, Series 3 machines can command a higher premium than their successors. Psion's last 16-bit consumer PDA, the Series 3MX launched in 1998, may fetch over £100 on auction, while a 32-bit Revo can be picked up for as little as £20. The old machines are held in great affection; Healey himself says he traded in his Revo for a 3MX recently.

So much affection, that one former Psion director told us that inertia affected the business.

"That product was almost too good," the Psion executive says now, wryly.

"I was sitting on a plane in 2001 next to a man who had a Series 3. We got talking, and I introduced myself as working for Psion. He told me: 'It's so sad, your PDAs are beautiful machines and they work so well — and you're not making them any more. Why is that?'. I had to tell him the problem was

people like him — who wouldn't upgrade to our later models," he says. "That makes business much more difficult."

Psion was confident the users would — and it was largely correct. However, as a public company, it was the City of London which provided the most skeptical critic.

Engineering vs The City

Although the press saw Psion as fighting two competitors, it was really having to counter two deeply-held ideas.

The City of London had long held the view that Britain should be a service-based economy. This reflected a particular view of the world, which found itself expressed in a deep class-based disdain for inventiveness and the production of tangible goods. A 1998 editorial in *The Daily Telegraph* entitled "Metal Bashers Should Shut Up Shop" summed up the post-war orthodoxy of The City. Since the war, British businesses had to contend with interest rates twice as high as their European rivals, so investing in plant was much more costly, and their exported goods much more expensive than they needed to be.

Although Potter, with his own capital, had unleashed a world-class development, design and marketing team that punched far above its weight, Psion nevertheless found itself lumped in with the "Metal Bashers".

The other idea was more recent, but was expressed with a religious zeal. It was a view about what computer markets should look like.

Going horizontal

After several attempts, Microsoft had begun licensing a handheld operating system to a wide range of OEMs. The products were extremely poor and failed to sell, but there were lots of them, and Psion management took the threat seriously. At a product level, Psion responded by trying to make the Series 5 appear less idiosyncratic, and conform more to a "corporate standard". There was no corporate standard for handheld computing, of course, and if such a thing could be argued to exist, then Psion had already defined it.

Microsoft had a powerful weapon at its side: a way of looking at the way computer markets work that had become a simple, religious battle cry. Microsoft threatened to knock Psion out of the market using the brute force of this new view of the world: the "horizontal economic model".

According to the argument, the OEM products built with Windows CE may have been inferior, but the horizontal model that drove prices down in the PC world would be turned onto the handheld world, too. As a result, Psion would become a boutique manufacturer of superior products that few people wanted — because Microsoft's many OEMs produced handhelds that did the job, well enough, for most people at a lower cost. In this simplified view of the world, cost always beat quality — and there could be no exceptions.

Ever since digital technology had "liberated" capital at the turn of the 1980s, leaving it free to roam around the world looking for higher returns, Wall Street and the City of London had championed this view, lauding component suppliers for horizontal industries — at the expense of vertically integrated computer companies such as Psion or Apple. The City saw the horizontal model as more effective at squeezing costs out of the system, lowering prices — and therefore inflation — and giving a higher return on capital. Great vertically integrated computer companies such as Tandem and DEC had been hit hard by the rise of the PC, with illustrious names going under.

The truth was much more complicated than this simplified view of the world suggested. In many cases, these companies had failed to leverage their IPR assets as the market had changed: and in most

cases they failed to meet the demand for "open systems" in time — the PC world represented by Microsoft and Intel had little or nothing to do with it. And today, we can see there are thriving exceptions.

But this "model" became a religious mania; the City and the experts blessed Microsoft, even though it often had poor competitive products to offer — or nothing at all. Psion, it was predicted, would have to "go horizontal" and license its crown jewels.

A free pass for Palm

On the other hand, Psion's other principle competitor seemed to be exempt from this Holy War. Palm pitched itself not as a rival handheld computer, but a low-priced, pen-based PC companion: a peripheral.

The product "did nothing", in the opinion of Psion's senior management, who after all were designing their technology to be useful to people in 10 years' time. Palm had approached Psion hoping to be acquired — and Psion had rebuffed the offer. Charles Davies concluded that the Palm Pilot was merely "a software application boxed in hardware". It was a consumer electronics appliance.

It had consumer appliance numbers attached to it, however: the Palm PDA had become the fastest-selling technology item of all time in the US in 1997. And in the summer and autumn of 1996, there were few Psion users in the UK who didn't admire the brisk proposition offered by the new Palm Pilot.

In Palm's world, the technology in the handheld didn't really matter: it merely had to perform certain simple operations quickly and well, and was essentially subserviant to the "real" computer, which was the PC.

"You're basically saying the data lives on the computer, you can sync the device with the computer, you can take it out and fiddle around with it," is how Riddiford describes the Palm proposition.

Reflecting now, Healey says Palm taught Psion what it was really like to create a mass market user interface. Although the data input capabilities of the Palm PDA were extremely limited, the Palm allowed users to "fiddle" with an ease unsurpassed before or since: it was well-loved, and a deserved success.

Palm also benefitted from the "horizontal" mania. To Palm, all those years Psion had spent investing in making its handheld computing platform so very reliable had been wasted, ran the argument, because if you lost your data, you only lost your "fiddles". And if the devices were cheap (and getting ever cheaper) — well, then you'd simply buy another one. The US had far higher PC penetration than Europe — and Palm validated this market. What higher endorsement of the PC can there be, other than a successful "PC companion"?

That's not how Psion saw it. To Psion, Palm was an ill-prepared computer company that was pretending it wasn't a computer company at all. The "Zen" of Palm was an enormous deception.

Ten years on, Psion's original verdict on Palm may still be proved correct. Palm belatedly embraced phones, added (inferior) keyboards, and through its own mismanagement failed to update its technology base.

No British Sony

Psion couldn't help noticing a giant hole in the logic. The "horizontal" orthodoxy didn't really extend to consumer electronics companies. A giant like Sony is a vast collection of vertically interated divisions — often fighting each other viciously — but no one ever calls for Sony to cut its R&D or "go horizontal".

Psion Group executives can be excused for feeling beleaguered. By the logic of the critics, backed by PC-centric pundits who'd caught the horizontal mania, Psion simply couldn't win.

When Psion compared its computers to the Microsoft-backed competitors, it was told its product superiority didn't matter — because horizontal economics would win the day. At the same time, while Palm was feted as a "consumer electronics" success story, the same grace wasn't extended to Psion.

A confident Psion would have met both threats head on. Psion could have argued, in response to the Microsoft threat, that handheld computers are essentially personal, and in such an unforgivingly judgemental environment, a poor tool is a poor tool — and unsellable at any price.

A confident Psion would also have blown the smoke away from Palm's proposition by responding that the upstart was really a computer in a peripheral's clothing. And if "PC companion" was to ever be a viable market, it was one in which it would itself rapidly find itself a target, to be driven out of existence by larger and better-resourced players.

A confident Psion might also have remembered its engineering expertise, which was packing high functionality into a very low cost device, and marketing it well — and gone on the offensive, launching a slew of consumer electronics products.

In the end, Psion attempted to do all three: but its confidence began to ebb away. Potter, who had started Psion with £70,000 of his own capital — and watched it grow entirely due to its inventiveness and courage — now faced a City which didn't want to hear any such bold response. Potter began by addressing the "Microsoft" threat first.

The confusion blew Psion's consumer electronics planning off course.

One summer morning in 1998, more than 100 Psion staff discovered they had a new employer with a strange name. One hundred and thirty staff at Psion Software were transferred to a new entity, called Symbian, with new owners: Nokia, Ericsson, Motorola, and Psion. It was an amazing endorsement of the operating system the team had created — not just for Protea, but the years ahead. Symbian now had far greater resources to develop the OS, and license it widely as an industry standard.

Depending on who you to speak to, Psion either intended to spin out its crown jewels from the start — or simply realised it couldn't afford to keep them.

According to Myers, Epoc (now called Symbian OS) was created with the idea of licensing it to a mass market, right from the outset. Gretton says Psion realised it couldn't afford to develop the operating system on its own if it was to realise its potential: the development costs were simply too high. These accounts aren't necessarily contradictory, of course, and in 1996 senior management unanimously agreed to reorganise the Psion group to focus software as a dedicated licensing operation. Gretton describes here how he spent a year selling the proposition to Nokia, and other large mobile handset manufacturers.

The Symbian story is well known — and beyond the scope of this article — but the consequences of the Symbian divestiture were dramatic for Psion's computer business.

Overnight, Psion found itself with no software engineers. In addition, the Psion Group's brains trust was broken up.

"Colly Myers, Charles Davies, Mark Gretton — these people really are visionaries," says Alan Ferdman, who ran Psion's test department. "And when you had them together, the effect wasn't linear — it was exponential".

Myers went to Symbian, while Davies and Gretton (the latter, in a last-minute twist of fate) stayed at Psion.

But Psion's ability to create integrated products, with close liaison between hardware and software experts, disappeared overnight.

"Symbian just sucked Psion dry of software know how overnight," another senior figure recalls.

"David Potter took all the brains and software guys out of hardware, leaving it as just a shipping and production entity — so it had no control over its destiny," is how Gretton remembers it.

(For its part — Symbian was now creating a generic component, and couldn't bring the obsessive attention to detail required to perfect the final pixel-level user experience that Healey, Batchelor and Myers had brought to bear on successive Psion computers. Symbian only resolved its UI strategy years later.)

The overnight loss of almost all Psion Computer's software engineers wasn't to prove damaging financially or logistically right away. But it meant a new round of recruitment and training. Eventually, the split would have a profound long-term effect on what became Psion's most intangible asset: its confidence.

The group's industrial and telecoms businesses were doing well — Psion Dacom's PC card modem became a global best-seller in 1999, while industrial sales were steady — so the results didn't show up in the bottom line right away. But for Gretton, who'd been landed with the job of re-assembling a cohesive technical team, the delay wasn't welcome. On its home turf, Psion was facing its fiercest ever competition from Palm and Microsoft, and needed to increase the frequency of its leisurely product refresh cycle (it was three years before the Series 3a was upgraded with more memory and an iR port).

Two follow-up products to the Protea, a slimmed-down model aimed at consumers and an upgraded Series 5, were already in the pipeline. Both ASICs were designed by ARM, in a new partnership for Psion, but they wouldn't hit the market until two years after the original Series 5. And it would be 2001 before the successors to these products (including a colour Series 5) were near ready. During that period, Palm brought 11 new handhelds to market, including a wireless model.

David Potter had taken a step back from the business, appointing David Levin, a City expert with a close ear to the financial markets, as the group's CEO. Davies immediately assumed the leadership of the computer group.

Behind the scenes, Psion began to think the unthinkable.

Retreading the tyres

Psion responded to the new threats in two ways.

Ken McAlpine, a brilliant product engineer who went on to head Apple's PowerBook division, was put in charge of an "incubator", or "nursery", looking at new consumer ideas. McAlpine brainstormed, and examined many opportunities that could grow into consumer markets.

"We already had the consumer brand," says Davies of this period. "We needed the will to go into areas where we didn't have a phone competitor."

Despite the loss of the software engineers, Psion had much going for it, and the incubator was a recognition of its assets. Psion had an unrivalled talent for low cost consumer electronics hardware; it had close relationships with ARM and the burgeoning wireless silicon startups of Silicon Fen; in Martin Riddiford it had a mechanical design genius and product designer whose could connect with the public — and it was a trusted high streeet name.

Psion was also looking to appreciate its computer assets. The split had left it free to pursue partnerships with rivals.

This led to one of the most unusual "nearlys". Psion began a skunkworks project to allow Linux to run on its hardware. This wasn't difficult, the first 10,000 Series 5s were flash-based, and hackers could install whatever they wanted to on them.

But Potter also saw Microsoft as making inroads into the industrial and enterprise markets (Psion today is Windows CE-based), and before Symbian was even founded, had made an unusual approach to Microsoft founder Bill Gates.

"Our positioning on this was that Microsoft should position as Tier Zero, and we would get the market. We were brilliant at mechanical design; we had great product design and would therefore make the market for Windows CE," explains one former executive familiar with the strategy.

"We'd looked at CE, and figured out that Casio and Philips [CE OEMs] were predominantly impaired by the quality of the I/O drivers — they were clumsily done. So we started hiring CE driver writers."

Potter approached Gates with a proposition. Psion would make Windows-based hardware, if Microsoft would license its operating system to Psion for free.

"Microsoft said it never licenses software for free, so the deal never took place," he says. "I still maintain that if that deal had come off, Symbian would never have happened."

Today, Psion continues to sell an upgraded netBook as a Windows CE-based device to the industrial market. Only a few insiders know it was envisaged as a triple-boot computer with a choice of Linux, Windows CE, or Epoc inside.

Riddiford remembers more advanced projects too — which like the triple-boot netBook, have never before been disclosed.

"You'll have to remember that Psion wasn't religious about Epoc — it didn't have a choice. All the software people had just moved to Symbian," he says.

"We did the first Windows CE embedded GSM device — it was a joint Psion Siemens venture. That didn't work out either."

'One box or two?'

Under Levin, the group was constantly being reshuffled. A succession of managing directors followed Davies in leading the computer group: Harold Goddijn came in and encouraged left-field thinking, but was sidelined in late 1999. Goodijn subsequently moved to the helm of TomTom, and presided over its meteoric rise.

"Harold's gone on to prove what a terrific visionary and businessman he is," says Gareth Hughes.

"By the end we'd find out who our new MD was from the internet," recalls Tupman.

"The argument that raged in the corridors at the time, was 'one box or two?'" recalls Davies.

The argument was that integrated communicators would subsume other functions, making them uneconomic to produce — as people would only want to carry around "one box". The other was that a more focused device, for example a PDA with a better screen and keyboard than a phone could offer, could act as a complement.

Both cases had great merits, says Davies, and the market hasn't settled the issue to this day.

Smartphone sales are way down on the projections made at the turn of the decade, and as most smartphones are bought for their status appeal, the "smart" features go unused. The third-party mass software market that many anticipated, never materialised.

"The forecasts haven't come to fruition," notes Gareth Hughes. "The only application for smartphones that can be anywhere near is email — and the market for BlackBerry's is small."

Meanwhile, the "second box" business has flourished, with diversity being the keyword. Apple's iPod and TomTom's Navigator are hugely successfully standalone devices. The most successful "communicator" is RIM's BlackBerry, and yet that's really a secondary device, too, as most BlackBerry users today also have a primary mobile phone. Even Palm, which hasn't refreshed its PDA product line in two years, and gives it negligible marketing attention, still continues to make a handsome profit on residual sales of its PDAs.

Opinion has turned full circle: Palm founder Jeff Hawkins' latest "big idea" is to re-create the netBook as a "smartphone companion" called Foleo: an explicit rejection of the "One Box" he previously advocated at Handspring.

"With 20/20 hindsight, the difficulties in integrating a smartphone are extreme," says Davies. "RIM have achieved that, but don't forget they came from a deep radio heritage. Apple are an inventive company with a lot of spirit and good staff — but they will struggle with the iPhone."

Healey thinks the argument is needlessly dogmatic, today: "A great two-box solution beats a good one-box solution: *and* vice-versa. It's far more important to keep churning out groovy products."

House of Invention

McAlpine's incubator examined a wide range of what have subsequently become successful consumer electronics markets — and several more, too, that haven't.

"Psion were being approached by many startups who realised the brand value Psion could bring to a new area," recalls Hughes. "Before one had even appeared on the market, we were approached by a company that had an MP3 player that was Flash-based. It held only half an hour's worth of music, but we saw how that could evolve into a large market."

Tupman recalls devising a hard-disk based player around this time.

"Ken and I spent a number of months just driving around the country trying to pull together a plan to make hard disk drive MP3 player," he says. "Creative had their big CD-sized player with 2.5in drive, and there were lots of little Rio players; we thought we could make a play in that area because we had the technology. It was very much an investigation."

In October 2001, with Tupman now at Apple, the iPod was launched. In 2003, its sales exploded.

A suggestion to use the Series 5 system board, running Epoc, for a set-top box was also considered. Another skunkworks project envisaged was a gateway tablet device that acted as both a cordless digital DECT phone and a GSM handset. Ericsson had created such a product, and British Telecom with its then mobile subsidiary Cellnet (now O2) brought it to market in spring 1999. Priced at £399 with base station, it flopped, but it was a forerunner of fixed-mobile convergence products like BT Fusion. Psion also examined a wide range of possible Bluetooth products: Cambridge had emerged as the leader in radio silicon, and early VoIP products.

But the only project from McAlpine's incubator to reach the high street was a digital radio. The WaveFinder, as it was known, was launched (http://www.theregister.co.uk/2000/09/27/psion_mounts_163_299_digital/) in October 2000. This USB device required a PC, but it broke new ground in several ways.

"'Revolutionary' products are announced daily in the IT business, but Psion's latest, the Wavefinder, could genuinely merit the tag on a couple of fronts," we reported at the time. DAB, wrote John Lettice,

had potential as a data delivery platform (http://www.theregister.co.uk/2000/10/14/broadband_for_free_radio_kills/) —
a fact not lost on Psion's management.

A follow-up almost a year later told a familiar story
(http://www.theregister.co.uk/2001/09/10/psion_wavefinder_saved_by_software/): one of neglect and retail apathy.

"The WaveFinder radio was typical Psion," remembers Gretton. "It wasn't a great product, it had lots of
flaws — but it was completely revolutionary in its time — and DAB radio eventually became a valid
market."

Ironically, the DAB radio market today is smaller
than the SatNav and MP3 Player markets which
Psion rejected. Its potential as a content platform
has yet to be exploited.

"We had so many great ideas, and so many of those
industries have taken off," says Tupman. The
engineer recalls working on 13 projects in less than
three years, from the Symbian split to his leaving
Psion in early 2001.

Psion had other priorities, too. However as the
largest shareholder in Symbian, it had to fund the
operation proportionately, even though it was much
smaller than its partners Nokia, Ericsson, Motorola and (by 1999) Japanese giant Matsushita.

"At the time, all the R&D money went to Symbian," remembers Tupman.

Planners for the core PDA business did plenty of radical thinking, too. Two projects were started
codenamed "Houston" and "Texas" which integrated Dragon's voice technology into PDAs.

But management turmoil, and constant reorganisations beset the computer group. Gretton scored one
success, however. For years he'd been trying to get Psion to withdraw from owning its own
manufacturing plant. The "cowshed", as the engineers called it, caused lots of problems, and Gretton
regards the foray as one of Psion's most damaging strategic errors. In 1999 the rest of management
agreed, and the Greenford plant was sold off.

In autumn 1999, Davies' successor as Psion Computer MD Harold Goddijn was sidelined, to be
replaced Margaret Rice-Jones from Motorola.

Ominously, David Levin had made his mind up on the "one box or two" question.

Odin and Halla

The deal (http://www.theregister.co.uk/2000/01/31/psion_motorola_to_codevelop_symbian/) announced in early 2000
with Motorola was wide ranging. Not only would the two jointly develop
(http://www.theregister.co.uk/2000/03/01/psion_produces_surprise_arm_plus/) a range of pen-based smartphones
under the umbrella name "Odin", with the first of which scheduled to hit the market in mid-2001, they'd
use an entirely new silicon architecture developed by Psion, a young Irish semiconductor company
called Parthus, and Samsung. The "Halla" chip (officially known as InfoStream) would be the first
ARM9 based processor, and was packed with multimedia features. In an extensive cross-licensing
deal, Motorola would have first dibs on the resulting silicon.

According to Gretton, and his account is corroborated by others, much of Psion management and
almost all the Psion staff, strongly opposed the deal.

"I was deeply against the Motorola contract — for me it was the final nail in the coffin," he says.

In addition to funding the burgeoning Symbian operation, Psion was now officially in the semiconductor business. So overnight, it placed itself in competition with two of the largest and fastest-growing companies on the planet. From duking it out with unproven newcomer Palm and Casio's handheld division, Psion was now set head on against Nokia and Ericsson on one side, and Texas Instruments and other chip manufacturers on the other. An even more dangerous enemy existed in its new partner's camp: Motorola had its own semiconductor division and began moving at once to kill the Psion deal.

Fear of competition is often cited by former staff as a Psion characteristic. But for an insane moment, Psion appeared to stand on the table and want to fight everybody in the pub.

The relationship with Ericsson deteriorated. Ericsson had long nurtured the idea of a pen-based smartphone, and was the first phone vendor to ship an Epoc device in 2000. The Swedish giant cancelled Psion's contract as its preferred PDA supplier. Ericsson had rebranded the Psion 5MX, with some additional phone-friendly software, as the MC218. The next stage would have seen Ericsson rebadge Psion's Revo. The cancellation of the deal was costly for Psion.

Odin brought a fresh set of anxieties. Psion management was paralysed as the prospect of the scale of the battle it had bought into, and fatalism set in.

"There was a feeling of 'what's the point?' Nokia's going to kill us anyway," says Gretton in an view echoed by many executives at the time. "Which was totally self-fulfilling and which I don't subscribe to, then or now."

He points out that Nokia has yet to master enterprise IT channel sales even today. By the time of Odin, Psion had amassed 15 years' experience selling handhelds as part of an IT infrastructure sale. He regarded the Motorola deal as one backstab away from termination — and in January 2001, his worst fears were confirmed.

"I was in Germany…when Margaret Rice-Jones took the call from Motorola — and her face went white. She told me Motorola had cancelled Odin, and that we were on our own (http://www.theregister.co.uk/2001/01/30/psion_bid_for_big_time/)," he recalls.

"I knew that was the end of our business. We had no other roadmap."

As a cathartic gesture, Psion staff made a bonfire of their Motorola mobile phones.

Nevertheless, the product pipeline was at last full, and would give a long-overdue lift to Psion's PDA business. A colour Bluetooth Revo and a cost-reduced model were in an advanced stage: a TV documentary filmed Psion's marketing team auditioning advertising agencies for the launch.

(One of the agencies, clearly having failed to read the brief, hilariously proposed to market the new Revo as a "one box solution").

However Levin had no intention to pursue this option. He moved quickly to abandon the Psion Computer moniker, moving the staff to the more ambiguously named Psion Digital.

A statement issued on 11 July 2001 read:

"The decision to implement a significant restructuring of Psion Digital has been driven by the division's continuing poor performance in weak and oversupplied markets for handheld computers and related cellular phone markets. Further commoditisation of these markets is expected next year. As a result of the Board's decision and in the light of slower than anticipated establishment of a mass market for Bluetooth products, Psion Digital will not launch its Bluetooth PDA or range of Bluetooth connectivity products planned for the second half of 2001.

David Potter is quoted:

"The IT industry is experiencing its worst downturn since 1985. Against this background, it is essential that we take the hardest approach to costs, control and a return to profitability while avoiding exposure to oversupplied commodity markets. The enterprise markets of Psion Teklogix offer sound long-term growth opportunities, while Psion Digital will be focusing on its core assets in innovation and exploiting new premium markets for mobile networked devices."

"It had been an awful two years," says Gretton, who'd had to build up Psion's software expertise after the Symbian spin-off. "We were getting to the stage where we had programming resources at last, a stable platform, and were able to start turning out some product at last. There was great spirit there — then people scattered far and wide."

Davies now agrees that Psion "overestimated the competition".

Psion's strategy had been established the previous autumn. The markets had finally smiled on the Psion Group's "horizontal" strategy, and thanks to its 28 per cent stake in Symbian, they gave it an astronomical valuation. Psion was trading on the FTSE 100, and its 28 per cent stake would give it a handsome reward from a Symbian IPO: some guesstimated at least £1bn.

But instead of using Psion's astronomical FTSE valuation to move into a new area, Levin shored up the defences to buy the established industrial IT vendor Teklogix for around £240m.

Setting a torch to 18 years of consumer electronics success wasn't cheap.

Levin spent £29.2m exiting the consumer business, while a further £11.2m was written off to general restructuring — adding up to over £40m in exit costs in the first half of 2001 alone. Two hundred and fifty of Psion's 1,200 staff were lost, in addition to the 100 shed when Odin was cancelled.

Psion's users have mourned the decision ever since, and subsequent events suggest the decision wasn't so much rational, as driven by fear.

"We had a pile of cash that the company didn't want to spend," bemoans one of Psion product development team.

"The arrogance came back to haunt us. Psion was offered Palm on a plate and we didn't believe in it — so we told them to get lost. We still didn't believe in it even when we were being hammered by them."

"In the end we got ourselves," says Gretton.

"There was so much we could have done; we could have been a handset and yes, we could have been TomTom, we could have been a handset vendor; we could have been RIM — but all the appetite and all the aggression was gone," says one manager who left at the time.

Potter, Davies, and many other senior management now agree Psion left the business too early. The "depression" that hit global telecoms sales so hard in 2001, turned out to be barely a frown on a credit-

powered British economy. UK sales of PDAs rose again in 2003 to their highest level for three years —
but Psion wasn't there to take advantage of the Indian summer.

Psion's unreleased Revo, with Bluetooth

Scheduled products such as the Bluetooth Revo and the modem-equipped Series 5MX would have
made the product viable for much longer. Levin's anticipated "commoditisation" took much longer than
a year to materialise. Even today, Palm sells two PDAs based on a a mainboard and OS whose spec
hasn't changed since it was launched five years ago. Palm's belated addition of rich colour and
Bluetooth in 2002 gave it a lasting lease of life. It's pure profit.

"David Levin had no feel for consumer electronics," says Gretton.

"The great stuff was done out of a can-do spirit that was gradually lost in the latter years… Psion died
by a succession of blows, people with less and less ambition — and more fear."

Asked why management lost its confidence, Gretton suggests: "They got too rich probably and too
involved in the City — that's another world that didn't understand Psion."

"There was so much waste, so many ideas, and so many talented people. It's amazing what was
achieved — and then thrown away." ®

The Protea Story

After Protea: Psion from 1997 to 2001

In their own words: Mark Gretton; Martin Riddiford; Nick Healey; David Tupman; Sir David Potter;

"It's amazing what was thrown away." — Mark Gretton

**During 17 years at Psion, Mark Gretton designed the hardware architecture for both the Series 3 and Series 5
organisers. He designed numerous ASICs along the way, and also took a management role that led to the formation
of Symbian. In Mark's words:.**

In the early days David Potter was very involved in the company and he was prepared to take big risks.
He bought into the idea and believed in it himself.

Gradually he lost that passion in the business, and decisions were made by people who didn't
understand the consumer electronics business, and didn't have the stomach for it.

He let it go away.

There was so much waste, so many ideas, and so many talented people. It's amazing what was
achieved — and then thrown away.

How I joined Psion

I joined Psion to do cross compiling in 1986. We were in the last stages of launching the Organiser II. The whole system was emulated on a VAX in C. This code was used as an executable spec for people who hand compiled the machine code for this tiny little washing machine processor. It was the only way to get it into a small enough space. It was incredibly labour intensive but some very bright people took an almost religious pride in the quality of their cross compiling.

I then started work on a 16-bit architecture with a completely blank sheet of paper. It wasn't clear what the first product would be, it was simply an architecture for 16-bit handheld computing. The first product turned out to be a massive project — the MC, a revolutionary new solid-state laptop computer.

"It was a bridge too far… we couldn't get away with that now."

The MC project was completely mad; it was insane. This was an entirely new laptop, a new architecture four new ASIC chips, a new OS, a new GUI, and a new suite of business applications, all in a new product — and we thought we could do it with just 30 people. Looking back I can't work out why we thought we could. Colly Myers had a saying at the time: "Don't look down!" That was the trick.

We launched anyway, even though the hardware was dodgy and the software was dodgy. It wasn't reliable. You couldn't get away with that nowadays.

Mark Gretton

But it was bristling with innovations. Flash memory was new, so we invented a serial bus, and created the first solid state disks. We invented a new touchpad. We invented all sorts of new power management techniques, and a whole GUI was drawn up.

It was a bridge too far everywhere you looked, and it didn't work out. But it let us hone that architecture.

Success out of failure

We then said let's do a small QWERTY based product on this 16-bit architecture — that was the birth of the Series 3 — my particular project. We'd designed ASICs before — I designed three for the MC. So I started a project to put 3 ASICs and the CPU on one chip.

It's standard practice now to make an ASP [application specific processor, or "system on a chip" — ed], but it was absolutely unheard of at the time. I spent a good few man years of my life on this project — by this time I had a CAD workstation (as opposed to a mainframe for ASIC simulation) putting an 8086 processor and all the gubbins, such as LCD controller, on that one chip. It was actually about nine months I was chained to that workstation. That chip made the 3a possible, and by then we had a stable, robust platform.

The 3a was the first time everything came together and it was a really great product — and it sold very well. So the massive undertaking of a whole new architecture was finally paying off — it went on to survive for over 10 years.

We can't do it all alone

As sales of the 3a were taking off, more long term questions were asked, such as "do we need a new 32-bit architecture?" This lead to a relatively small team starting development on our 32-bit platform (Epoc32 as it was called then).

Again, I started on the hardware. Again I looked at lots of CPUs, but in the end chose ARM. Again, this was not the obvious, mainstream choice it would be now. Then, ARM was unheard off outside of Acorn and ARM (Newton). But technically it was strong in terms of MIPS per watt and die area: people still counted [transistor] gates quite carefully in those days.

That was Eiger, an ARM710 based ASP or SoC. In parallel, a complete new 32-bit OS was developed, a mammoth task. This went on to become the Symbian OS which has shipped in over 100 million smart-phones. In fact, it was such a massive task that it soon became clear the expected revenues from PDA sales alone could not justify this level of R&D investment.

I worked with a couple of others including Colly Myers to prepare something for the board that basically said, "we can't compete with the hardware business alone, we should consider a licensing model, and restructuring the company around that".

There was an expression going around at the time: "Is Psion going to die like IBM, or is Psion going to die like Apple?" Would we open up and license our technology, or — and remember Apple was really, really suffering at the time — would we die like a closed proprietary system? So we decided to die like IBM!

(Now, at TomTom I can say we've survived like Apple!)

So the company split up into four [Psion Computer, Psion Software, Psion Industrial, and Psion Dacom] and I joined the board of what was then Psion Software, which went on to become Symbian with Colly, Bill, and David Wood, who's now a senior VP at Symbian. For the next year, I spent a lot of time in Tampere in Finland at Nokia, doing pre-sales, selling the idea. There wasn't a lot to show them — prototype Series 5s and development boards for the OS — but the premise was "Look how great our 16-bit stuff is!" And Nokia went and benchmarked it and saw that yes, it really was highly efficient and highly reliable.

Psion splits

Back in London we were having a terrible time ramping up production of the Series 5 at our own factory in Greenford. Everything was going to shit. David Potter pulled me aside one day and said, "we need

some good guys in the PDA business" and put me back into the hardware business. So I left Psion Software and joined the Computer side, running the engineering side. After the restructuring and formation of Psion Software most of the brains and software guys had been stripped from the PDA business, leaving it as more of a shipping and production entity — it had no control over its destiny and was totally wrapped up in its production problems. I desperately tried to get Psion out of the manufacturing business — there was no shortage of people in Asia willing to help us — but David Potter was against this. Again, it was one of his big strategic errors.

Then in 1998, Symbian was announced. Everyone thought they'd take over the world, while I thought ,"Shit — I've made a bad career move [moving back to the PDA business]."

Let's do a smartphone!

It was a tough time. The PDA business was not performing and it had lost its technological core and control over its destiny. Symbian were not interested in our business as they were focused on smartphones and Nokia. I survived on the management board but only just and we went through a lot of MDs.

At one level things looked up, we now had a mature and stable 32-bit OS and a cost effective platform and at last, following the Revo introduction, high quality outsourced manufacturing.

I was in charge of the Psion Computers roadmap and presented countless new products. These included a colour version of the Series 5MX, a road warrior 5MX with a built in modem from Dacom, a Blackberry style device, like the Revo, with wireless push email, called Project Blade. There was also a cost-reduced Bluetooth enabled Revo on the roadmap.

But the commonly held belief then was that PDAs were dead and everything would be connected: ie, a smartphone or Nokia Communicator-like device. At the same time David Potter recruited a new group CEO, David Levin. He was convinced we could not be successful with a smartphone without a powerful partner from the wireless world, and so we signed with Motorola to do Odin.

There was a feeling of 'what's the point?' Nokia's going to kill us anyway — which was totally self-fulfilling and which I don't subscribe to, then or now"

I was deeply against the Motorola contract — for me it was the final nail in the coffin.

Even if doing a smartphone was a good idea, Psion could have done it on its own. At the time we were working with Inventec and other companies that had their own cellular technologies. It was an investment, but compared with some of the stuff we'd taken on in the past it was nothing.

The iceberg looms

David Levin, the new CEO had no feel for consumer electronics. So against the advice of most of the Psion Computers' management team, including me, we signed the deal with Motorola.

Motorola were notorious for shafting other companies or indeed other parts of the group, it was a highly political organisation. Either the semiconductor people were shafting the handset people, or the other way round.

Now the argument was that Motorola had the sales channels, that was the rationale. But the phone channel was the network operators and they didn't understand smartphones; arguably, they still don't. But PDAs were sold through the IT channel. We could have sold Odin through the IT channel quite effectively.

I was in Germany in 2001 when Margaret Rice-Jones, Psion Computer MD, took the call from Motorola — and her face went white. She told me Motorola had cancelled Odin, and that we were on our own

(http://www.theregister.co.uk/2001/01/30/psion_bid_for_big_time/). I knew that was the end of our business. We had no other roadmap, no plan B.

It had been an awful two years.

We were getting to the stage where we had programming resources at last, a stable platform, and were able to start turning out some product at last. There was great spirit there.

Yes, PDA sales peaked in 2003 and it wasn't for lack of trying that I tried to revive the business.

A third revival?

Even by itself, the Bluetooth Revo which was ready for launch [cancelled 11 July 2001] would have continued to be a profitable niche, I'm quite convinced of that.

The Revo made even smaller would definitely have made a good wireless email terminal and there's no reason that couldn't have gone on to enjoy sales. Almost all the things were there: you need good keyboard, good battery life, you just need to put in a GPRS modem. The sales channel didn't have to be the operator. Where there was a bit of work needed was on the server side; but there were smart people in the company and we could have cracked that. We'd just lost the ambition.

Following 2001, I worked for two years in the wilderness doing push email software, Again, there was no stomach for taking this to the consumer so it got given away to Visto.

And Visto killed that as well — David [Potter] just wanted shot of it and gave it away, the people and everything.

In the end, fear triumphed.

During the whole Symbian hype, when the Psion share price was high and the Dacom side of the business was doing well, a group was set up called The Incubator Group.

People wrote business plans for new ideas. One was Blade, the push email system. One was a Hard Disc based music player, that Ken [McAlpine] wrote (before Apple launched the iPod). And another was a DAB-based receiver, a PC peripheral, that Ken proposed. That was the only one to make it to market. Even navigation devices were discussed.

The WaveFinder radio was typical Psion: it wasn't a great product, it had lots of flaws — but it was completely revolutionary in its time — and DAB radio went on to became a valid market.

"They got too rich probably, and too involved in the City."

Psion did this more than once. They create a market, but you've got to keep at it. They made a huge technical investment with huge innovation but lost the will to keep at it. The senior management board lost interest in the technology, and they weren't engaged in it personally.

Why? They got too rich probably, and too involved in the City — that's another world that didn't understand Psion.

The great stuff was done out of a can-do spirit that was gradually lost in the latter years; the split didn't help. It wasn't fatal in itself. Psion died by a succession of blows, people with less and less ambition — and more fear.

This fear became self-fulfilling. The mentality was that everyone will get us: "Nokia will get us, Palm will get us, or the Japanese will get us"… in the end we got ourselves!

It was OK when were in a niche — that was fine. But if you're successful in a niche and sell some stuff, then naturally you get competition. To me this isn't a problem — it validates the market.

The idea at Psion was that this was a bad thing and you had to move on. It's in a marked contrast to TomTom. We're in a real market, meeting a real market need — and we've sold an order of magnitude more than Psion ever did. And of course we have over 300 competitors — and still hold on to 50 per cent market share! If a niche ever grew so it wasn't ever a niche, Psion abandoned it.

There was this fear of competition that was right in the heart of David Potter.

After leaving Psion, Mark joined a small Dutch PDA software company TomTom in 2003 run by former Psion Computer MD Harold Goddijn. As chief technology officer, Gretton assembled a team of former Psion engineers to create its first hardware products. In fiscal year 2006, TomTom reported revenues of €1.36bn making a net profit of €222m.

'Less is more' — Martin Riddiford

(with Jim Fullalove)

We're not particularly techie as people, we're not chasing the next technology bus. But we think we're useful because we see things through the eyes of your average consumer, not a techie. Most clients are techies too.

With the Series 5, we simply looked at the Series 3 and focused on anywhere we could do things better. The keyboard was the most obvious.

When we first created a keyboard that size, people said, "you can't use that, it's too small!" But people thought they'd be sitting at a desk. There's really two modes of using it. In one, you hold on to it and do what we call "squirrel" — type with your thumbs. Or you sit down and you touch type. A successful device does both of those.

We quickly realised that by angling the keyboard towards you, you don't need a display that changes, that moves to or away from you, because you already know where your hands are. It's just a matter of getting rid of the glare. Unfortunately, once you had a touch screen, you had more glare than the fantastic Series 3 screen, which had great anti-glare. With a pen the only complication was that it didn't tip backwards.

The size of the device was quite straightforward. With the Series 3 we started with a tiny screen — that was dictated by cost. We knew there were two solid state discs, and a speaker in the middle. With the Series 5, it was probably the speaker, the two AA batteries, and the serial connector. Those were relatively known factors.

It eventually got to be slightly bigger than the Series 3 which was annoying. It was a millimetre bigger. But we made use of every little millimetre of that space.

Martin Riddiford, with DateBook

Martin Riddiford co-founded design company Therefore Ltd with Graham Brett in 1993, with venture financing from Psion.

Who's the competition?

I think the problem was they abandoned the original EPOC, EPOC1 [renamed SIBO after 1997]

That was very innovative, very easy to use, and then they basically started on the Series 5 software which was much more grown up. It was about putting a laptop in your pocket, which was fine for a small niche, but not what a lot of people wanted. They were following a technology trend, leaving behind a really fantastic operating system that fizzled out and died. It could still be relevant today. That's what's so sad.

There were a number of things in the Series 5 to show we can multitask with these fast new keys. Windows CE was coming out and the Series 5 had to become a CE-buster. I don't know why keys such as the diamond, Psion's own invention, were dropped. Whether the new keys were actually used by anything was another matter. And in the Series 3, you can start typing in the address book and it would just find the person matching the string.

Connectivity had always been a problem. That's where Palm came through, they said "connectivity is king". You're basically saying the data lives on the computer, you can sync the device with the computer

You sync the device with a computer and you can take it out and fiddle around with it — it's a very different way to look at it. Psion was saying the data is in the handheld — you can back it up if you want.

DateBook

We had a concept for managing an address book that we patented in 1997, DateBook. But it was going away from where David Potter wanted to go. David Potter wanted an online PDA — and so it was always about data.

We wanted to combine a popular area of the Psion — database and diary and the ability to write text, but not neccessarily communicate it at the time — into a nice simple small form factor. It was a phone plus the ability to do Psion things.

"It wasn't Psion's mentality at all to see what competitors were doing."

Three times we nearly sold it — to Philips, Siemens and T-Mobile. Every senior person we showed it to loved it — but you try and make it work in a company like that. Some people wanted to make it an IM device, some wanted some great panoramic 3D thing — everything except a simple pocket address book in your phone.

We got a 150,000 first order pledge from T-Mobile, after nine months we went to sign it and that very day they turned round and said our allegiance is with Microsoft — and from now on all T-Mobile products would be based on Microsoft software. That was in 2004.

If you ever find an interested party, let us know.

So many Psions we never saw

There were so many project that never saw the light of day.

We did a whole bunch of things with phones in them. There were projects to do screen only devices — a number of aborted screen-only projects. Before Odin, we did a skunkworks project — Ace — which had a screen on the front. It was never shown to anyone. It was around the time Harold Goddijn [today TomTom CEO, and Psion Computer MD after the Symbian split] joined. It really was "Help, Palm are doing this!"

That was unusual — it wasn't Psion's mentality at all to see what competitors were doing. So we had a skunkworks projects with Ken [McAlpine] to see how we could put that [?] into a smaller case.

We did Hero, a hybrid with a display on the outside. There was an LCD and buttons that allowed you to make calls and preview texts without opening the case. It was going after the Communicator market. There was eventually a Revo and a phone module, reducing it in size further. We had to get around Nokia patents for displays and key interfaces on the outside — a Communicator had that and we had to steer away from their design.

There was a Series 5 keyboard in a Series 3 form factor — basically a low cost device — with retracting legs so it could stand up. It had no hinge, which made it stronger. We did the first Windows CE embedded GSM device — it was a joint Psion-Siemens venture. You'll have to remember that Psion wasn't religious about EPOC — it didn't have a choice. All the software people had just moved to Symbian. That project didn't work out either.

Then there were versions of the Series 5. It had been designed so that the back could be removable — there was a quite deliberate decision to put the PCB [printed circuit board] on the outside. So we came up with a version with a PC card that could house a PC card modem. There was talk about doing a GSM module as well. It was possible to do all that in the platform, but it never happened.

We did one with a standard Fujitsu keyboard and went through agony with Microsoft over it.

There were several more Revos. The Bluetooth Revo was ready, but never saw the light of day. They were more bulbous and had a big curve on the front to hide the Bluetooth board.

But the Revo battery was unreliable. It was embedded, but not li-ion [two AAA rechargables] so it didn't hold charge very well. The Series 3 was fantastic because it had a lot of latent energy in the backup battery — everything seemed to last for months if you didn't use it. The S5 backup battery is a bit dodgy — the backup only lastes a week. But as soon as you use a rechargeable it's an iffy proposition. Data integrity was always seen as really, really important at Psion.

It was really frustrating that flash memory was so expensive at the time. An all flash memory machine would have been the answer. People would have been prepared to pay that extra bit for that proposition, I think.

Psion's legacy

Psion was always wanting to be one step ahead. With Pogo and TomTom, the pioneering spirit is there. They were and are looking at the mass market.

David Potter was never very happy to do that. Psion were very cautious with numbers — they didn't take the opportunity to do bigger volume products. Now you can say Palm, who were a very commercial venture, overproduced by three million one year [2001], and Psion would say, "well we're still here — what a good thing we didn't either".

Therefore we've become a broader church — with greater cross sectors. It's all about keeping it simple. Technology unfortunately makes things more complicated. When a company returns with a new version of its product, it says: "All those problems in the last model, well, we'll forget about them because we want these new features in". We say, "forget all about those new features".

For us, Psion brought us a lot of opportunities. Half our business today must have a connection with Psion.

Therefore Ltd (http://www.therefore.co.uk/) is a successful design company with clients including Oki, Toshiba, Fujitsu, Sun Microsystems and Naim. It has designed all the hardware for TomTom, over 20 DAB radios, the Inventure backpack, and the Presso (http://www.presso.co.uk) hand-pulled coffee expresso machine.

'My brain was coming out of my ears. Literally' — Nick Healey

Nick Healey was a lead designer on the Series 3 range of PDAs, head of the design team for the Psion Series 5 applicatins & UI, and head of design at Symbian.

I joined Psion in 1984 as a programmer, with a degree in Computer and Microprocessor Engineering — the ideal background for a designer.

By the time of the early 1990s, Psion had survived a few cycles of redundancy, so everyone who was left there really knew their stuff, which was handy as the company didn't really do much management, training, or strategy.

As for hiring policy, the plan was always just to recruit big brains. Psion did the single most important thing that management should do, and did it very well: find smart people, make them happy so they don't leave, and set them free to use their talents. Do that and everything else takes care of itself, I reckon. It's really not rocket science, as long as you can find middle managers and indeed senior managers who can accept life in such an environment. If you get this right, you don't have to bother reading books on management, which is another bonus.

I'd worked on the specs for the apps and the user interface for the Series 3 machines We were pretty proud of those machines. There aren't many tech gadgets from 12 years ago that I can imagine using nowadays, although they are bringing back the Casio LCD TV experience on your mobile phone, only

worse and more expensive than before. Even today, the 3MX does contacts, diary and note-taking really well. It's a great PDA as long as you don't want mobile email or web, and who'd want them unless you had a wide screen and a keyboard you can type on. Come to think of it — like a Series 5. Or a 3MX! I'm just converting from using a Revo to a Series 3MX at the moment, by the way.

But no one could say how long the Series 3a would sell for. It was an uncomfortable time for us at Psion — it was possible that the Newton would take over the market, or perhaps the next HP palmtop, or something rumoured to be coming from Microsoft.

Nick Healey

Organising the new Organiser

So Protea kicked off properly. David Wood, Bill Batchelor and myself were the three development managers in the software team, and on the Protea project itself, that became known as the Series 5. Bill was the project manager.

I ran the specification team, and David had the job of creating and managing the application and UI-level Software Architecture — and teaching all the new coders. Having long ago forsaken coding myself, I was the only designer in a sea of coders. My software specification team had the job of what the software should and shouldn't do, and the UI to do it.

We moved into new offices and September 5, 1994, 12 new coders arrived, doubling the size of the software team. It was the day after Colly's [Myers] 40th birthday bash: "Happy birthday, see what you can do with these guys."

Unfortunately, I was delayed by designing and project managing the PsiWin connectivity software, a thousand apologies for which, well for the reliability anyway, and by the time I got to the Protea project the software engineers had already written lots of stuff.

They'd implemented Windows-style dialogs, for example — a 2D-layout that had enormous flexibility, but it was completely unusable from the keyboard. They agreed to throw it all away and write an "up-and-down" dialog layout you could navigate with just the arrow keys, after a month of gentle persuasion and personal threats.

Arguing the toss

It was a very argumentative culture, just because of the number of experienced, argumentative people. Healthy, I think, if a bit scary.

Colly's influence was all-encompassing, and it could be scary as a newbie when Colly himself will come to your desk and tell you what a **** you are. You soon learnt that this was just part of the "training" at Psion. And that you could give it back to him.

The culture was to argue as long as you liked with anyone you wanted to. I had an argument with Colly once, with me saying that impossible timescales are worse than having no timescales, to him it was just the opposite. Like it really matters. But it lasted from about 9pm till they threw us out of the pub at half eleven, and it continued on the street outside the pub till a quarter to one, when some understandably miffed woman leant out of her bedroom window and impolitely invited us to go home. Sadly, neither of us had given an inch in four hours. Colly had a heart attack when he got home — nothing life-threatening, and he forgave me.

Designing for simplicity

The overall goal was to make a machine that would wow the PDA world, which at the time was pretty much the Series 3, but an aim was also to interfere with the laptop market a little. So — an uber-Series3, a jack of even more trades. And then the Palm Pilot arrived mid-project, and everyone at Psion laughed, because it hardly did anything.

With the Palm Pilot, we learned the hard way about functionality for normal people [It was the Palm that taught us "the hard way" and showed us that in fact we weren't really getting to normal people at Psion]. It turned out that what reviewers called "user-friendly" — only about one in ten of the population could actually handle. It's still the same nowadays. I did run user tests on the first Series 5 prototypes, actually, in my own time, not that I had any, to the sound of a stable door being bolted, but normal people weren't formally part of the development process. They're "rule one" nowadays, for me, with every client I work with.

On Protea we had a "Thought Police", which was a committee of three, David and Bill and myself, and if you had an idea for a big change to the spec, you only needed the approval of two. It allowed a huge range of new ideas and fixes to go through, without us getting bogged down in red tape. Come to think of it I'm honoured in the Series 3MX easter egg as "Thought Police" too. Clearly, I was enjoying myself.

"With the Palm Pilot, we learned the hard way about functionality for normal people."

Products ship when "pressure to ship" exceeds "desire to improve". Protea, like every Psion project in the 90s, took twice as long as its original schedule, as we always attempted too much, and ending up losing things late in the project which would have been much better lost earlier. A fair few of those things turned up in the 5MX.

And also, we treated what were really "best case" targets as deadlines, and of course hurt ourselves by rushing things to try to achieve the unachievable. So "desire to improve" stayed pretty high, as more and more things went wrong, while "pressure to ship" slowly mounted to the same high level.

It was a deeply stressful way to live. At one point it felt like my brain was coming out of my ears — I mean, literally, for days, weeks, my head felt like it was exploding. I had to have an MRI scan. They found nothing, as they say.

It was all particularly depressing for me because in 1994 to 1995, I had written up a load of thoughts for the other senior managers on the reasons why all our projects ended up taking twice the desired timescale. Like using best-case targets as deadlines, and so on. I guess I just didn't sell it well enough.

We had one fun Protea meeting in February 1996, with the "deadline" then October/November 1996, in which the 15 or so managers on the project, from Colly down, were invited to give their best estimate as to what the real ship date would be. Everyone reckoned October, November or December, bar one guy who said February 1997 — take a bow, Geert Bollen — and me. I said a few words as to why I felt it had all the same problems in front of it as all previous projects, and that it would therefore take twice its current schedule, which came to the last week of May 1997.

Colly tore my head off for daring to say such heresy, but in the end I was out by a week, and we shipped the ROM the first week of June 1997. And again the week after. It gives me no pleasure to say this. It did almost make my brain explode.

Indeed, if you looked at every previous moment that we'd rescheduled the project, and just doubled the timescale we'd estimated each time, then every single doubled estimate came out at May 1997. Hardly Bill's fault, I hasten to add — the company was asking him to try to achieve each impossible deadline. He was well aware of all this.

By the way I heard a couple of years ago from one who was there that the "Zen of Palm" was to a fair extent reverse-engineered after the success of the Pilot, that in fact they actually dropped a lot of functionality from it, late on, through time pressure. That's pretty funny, if true.

"Psion did the single most important thing that management should do: find smart people, make them happy so they don't leave, and set them free to use their talents."

But it's a hard thing to manage. Symbian, I gather, are currently trying to reduce the number of experienced and expensive employees and they have a micromanaged production-line environment there. It's ironic that the move towards this was born out of a desire to hit software targets better than in the old Psion days. The best intentions, and all that. The timescales are more predictable, but at what cost?

A new nightmare at Symbian

A year after Protea shipped, Psion Software overnight became Symbian, and all the software people bar about one moved over. Suddenly, Psion Computers had no software design experience. I did have the offer of going to Psion Computers and being their design person for the software side, and in retrospect I so wish I had done.

Psion were a bit unsure about speccing out the software in their products by themselves. Like they did with the Revo: they just chucked the Series 5 software onto a much smaller screen — without a backlight too — and so a lot of the text is smaller than it ought to be.

So I found myself at Symbian as its lead software designer. It was a nightmare.

It was set up with a schedule to develop four new phone-centric versions of the EPOC (now renamed SymbianOS) UI in 18 months, which was laughably unachievable even without having to find and train enormous numbers of new employees. And before four new corporate overlords each began demanding every possible second of your time so that the other three wouldn't get it.

And being the only senior software design person was an especially unjoyful experience. On one of the four platforms, we had to combine the spec of our previous Psion applications and user interface, with the specification of a new device Nokia had been developing. So there's me locked in a room with about 15 Nokia designers, who, it slowly transpires, view Symbian as a software house they have just bought in order to deliver their product.

I explain to them the thinking behind the various things in the Psion UI — why it just saves changes automatically, why a second tap means "open", why it has infoprints [informational messages] in the corner, why ToDos appear on the main Diary screen, all that kind of stuff that we'd worked out over the years, and they listen and then they say "yes, but we want you to do this". So we didn't exactly get on well in those meetings.

And after a couple of days we realised there was an even bigger underlying issue, which was that we each put entirely different types of stuff in our specs because they did entirely different jobs as part of entirely different development processes. So I went back to the board and asked the rather obvious question, "So what's Symbian's development process?" and got the answer: "We haven't got one yet. Just do your best." It was great fun, the Symbian deal.

A few months down the line I'm in a meeting with one of the other Symbian shareholders about one of their phones, and I find myself selling a largely fictional plan for how we could allegedly deliver their software in the given timeframe, and their senior guy is tearing me to shreds. Now this is a guy who was involved in the due diligence on the formation of Symbian, and approved all these ludicrous delivery dates. I opened my mouth to tell him exactly where he could stick his dates, and after several seconds with my mouth open, I decided to quit. It had been seven months of hell.

Then I *really* wished I'd gone to Psion Computers!

What really happened to Psion?

In 1998, Psion lost all of its software expertise to Symbian, which proceeded to slowly borg it into bureaucracy. But Psion had absolutely fantastic product engineers, and grew a new software team. It also had a fantastic brand in this country, and in many others, and it had a history of designing groovy new things too.

But even after this, I'm told they turned down internal proposals to develop some really exciting new stuff like an iPod, and a TomTom, years before Apple and TomTom did it.

They even pulled out of some straightforward projects — like pulling the Bluetooth Revo at the last minute. My best guess is that they got distracted by their ownership of the stake in Symbian — as you well might, if you're thinking you might be about to own the mobile phone world for free.

Since leaving Symbian in 1999, Nick Healey's UI consultancy Slash Design (http://www.slashdesign.com) has designed smartphones, PDAs, PC-phone integration software, Linux suites, mobile apps, internet radios, pointing devices, and a restaurant.

'Every microamp is sacred' — David Tupman

Engineering for low power

I joined Alan Ferdman's test department at Psion in November 1995. Most of the engineers came through there, and then went on to design. In testing, you had a great chance to look at the whole design and learn how it all worked. We benchmarked ourselves against other companies — against the new Windows CE devices, to see how much power they used for the same function. Psion handhelds used about a quarter of the power of the CE machines.

A lot of this was actually due to the software. With the hardware, you do your best, and use techniques such as clock gating. With process technology improvements we'd gain too, and we looked at offloading onto special hardware. While Windows machines took all the standard parts, Psion developed its own silicon. All credit to Mark Gretton for that — he was the big instigator for getting the Series 5 silicon going. He was just a genius, really — and we all worked very closely with the software team. But software played a big part — it was about how they used the hardware.

Power draw is all about how fast your clock runs — if you can slow that down as much as possible, that gives you the lowest power draw overall. Symbian OS back in those days had come from battery powered Organisers, and the Series 3, we had a ground-up understanding of making a lower power system. The Windows world was all about performance.

Why is software so important?

Remember that software isn't doing anything 99 per cent of the time. If you're entering something into Agenda, you only need the activity when you're pressing the buttons; and you wake everything up. So it was all about that dynamic range — how low power can you go when you're not doing anything, and how fast can you go when it's active. We had a very wide dynamic range — we could get it down to nothing, but something happened, the full performance was there.

Beyond Protea

We had a saying in engineering that "every microamp was sacred". We had to account for every microamp of power — every day that would be the mantra.

After the Series 5, I moved into the design team developing silicon for the 5MX and for all the follow-ons. As with Protea, we worked very closely with Martin Riddiford's great company Therefore, to make sure everything would fit in the product — driving package side, components, to make the PCB as small and as thin as possible.

Martin always came up with these amazing mechanisms. Just look at the hinge on the Series 5 — or even the Series 3. Martin's a genius at making these crazy mechanisms work. So Martin's job was to figure out the mechanism — and our job was to figure out how to fit everything.

The Incubator

After the Symbian split, Ken McAlpine was just starting up his incubation team, his nursery team, back at Psion and a lot of ideas were coming out of that. Thinking back, I must have worked on 13 projects of which only three or four actually made it to production.

One of the problems we had was that every nine or 15 months we'd get a new general manager — there'd be a clean sweep and the old projects would get cancelled, and we'd move on to new projects. Sometimes we'd find out who the latest general manager was from the internet.

"We wanted to do SatNav."

They were all were really interesting things to work on, it's a pity they didn't make it out of Psion. But they were all really interesting and every time you work on something like that you learn alot — and that makes the product you actually ship that much better.

There was the Bluetooth Revo; there was chip called Halla we worked with Parthus and Samsung to develop, and it was the first ARM9 system chip; Samsung had never done anything like that before. That was cancelled with the smartphone, Odin.

Back then here was a lot of technology going around that Psion was keeping an eye on. We'd meet all the component manufacturers and had a lot of ideas on what we wanted to do. We wanted to be in cellphones, we wanted to do Bluetooth stuff, we wanted to do SatNav. A lot of times in the end David Potter would say no, we're not going to do that. And at the time, all the R&D money went to Symbian. We had so many great ideas, and so many of those industries have taken off: SatNav, with Mark at TomTom, and MP3 Players.

Ken and I spent a number of months just driving around the country trying to pull together a plan to make a hard disk drive MP3 player. Creative had their big CD-sized player with 2.5in drive, and there were lots of little Rio players; we thought we could make a play in that area because we had the technology. It was very much an investigation.

Unfortunately, there was no formal process for kicking projects off other than talking to David Potter.

Then the Psion and Motorola deal ended, we briefly tried to keep the phone thing going, but it really it wasn't happening. In March [2001] Psion laid off lots of hardware engineers [Psion laid off over 200 staff that day — ed].

I left shortly after that.

Our competition had gone from being the Windows CE people like Philips, to being Ericsson and Nokia, the cellphone guys.

One of my regrets is that Psion got out of the hardware business, pretty much. Actually, if you think about it though, a lot of the hardware business got killed by the cellphone. Look how much Palm suffered.

But it was an absolute blast. We shipped a million Revos, and to be part of that was great.

David Tupman is director of iPod hardware engineering at Apple

"You couldn't do everything forever" — Sir David Potter

"I founded Psion in 1980 and ran it until 1999, when I stood back partly for health reasons. During those 20 years the company was a synonym for innovation — in hindsight we created an enormous amount — from developing and publishing software, to the earliest microcomputers.

Now, when you've been chairman and chief executive for so long, your successor has a problem. You need to stand back and play the role of the company chairman. The style changed a little bit. I would criticise myself that we had not developed sufficiently wider commercial management in the company.

We'd developed a concept and the hardware or software was really secondary, it was a vehicle.

By the mid-90s we were involved in four areas. Organisers and PDAs; we'd found a big corporate market for enterprise solutions for mobile communications; we'd developed three generations of operating systems — which in the longer term was going to merge with cellphones so we formed Symbian with Nokia, Ericsson, and that became an industry standard — and the fourth was communications.

Unfortunately, I think we closed our consumer electronics side — which I think was in hindsight wrong — in 2001.

So the company focused on Symbian and on the enterprise side. And because of what happened in the telecomms industry when it went through a very bad recession, if you remember, we weren't able to ensure a balance of power in Symbian — because our shareholders and customers were the same. There was a conflict of interest, if you like. Unfortunately Motorola and Ericson were weakened by that while Nokia remained strong. There was concern whether the company could maintain not just market share but profitability for our shareholders as well.

Q: It's always been very hard for British companies like Psion with our historically high interest rates, and a class of experts who say Britain must become a service economy. Did you feel you always got the support of the City of London at Psion?

I have several issues with your question — or at least the premise behind your question. We haven't had high interest rates in Britain for 10 years, following the Bank of England's independence.

I think what is true is that governments, Conservative and Labour, in contrast to say Germany, have followed the idea that a service industry is fine.

They haven't said that in their speeches and their policy statements, but by the policy actions they've taken, that's been the effect. For the last 25 years the manufacturing sector in Britain has declined massively. In fact it's been declining for 50 years; from more than 50 per cent of employment in 1951 to 14 or 15 per cent.

Now in the global world we live in today that doesn't necessarily mean you have to make things — we live in a complex outsourced world. Today Psion is still a manufacturer, but it does that with a lot of partnerships, in China and a lot of other countries around the world. But the service sector, and particularly the financial sector, has attracted huge numbers of very able and bright graduates, and there's been very little strategic policy to encourage the other sectors in the country. In contrast to Germany and quite a lot of Europe.

It's an Anglo thing, and I think it's mistaken, because in the long run we need all these things. You need the ability to design and innovate and create the way you address markets. If you don't control the design and innovation of those business processes — hardware and services and software — then you don't really keep a hold on the ownership — and the realisation of where the profits and values comes back to. That's been the failure of Britain.

> ## "Britain lost its taste for commanding the heights of innovative new areas."

To our credit we have a successful financial sector — but then you have to ask how long that is durable. And look at the very large current accounts defecit and ask whether that really can be filled by the financial sector alone. I would question that, but history will have to decide.

What's really happened in our industry has been automation: robots have replaced people. If you make things like computers it's automated by amazing technology, produced by companies like Siemens.

I would contrast how America has benefited, not so much from design but by its huge scale, and massive government investment in the defence industry. The science came from Europe in the 1920s and 1930s. It was America who eventually drove the technology because of the need for very light and powerful and robust electronics in the defence sector. That's true of a lot of areas where America has been very strong.

So Britain lost its taste for commanding the heights of innovative new areas. You can look at a lot of the infrastructure in our country; we were building steam engines when the French were building electric trains following the war. Look at the railway systems France has now compared to ours. Other countries have picked up the pioneering great project.

Q: What consumer electronics could Psion have done if it hadn't pulled out? You looked at digital radios, navigation, music, push email…

While Psion originated some of the concepts, it couldn't have played in all of those markets.

The BlackBerry is the key one. The volume of BlackBerrys out there is tiny compared to Symbian — it has a base of more than 100 million units out there. What we and Nokia saw in telecomms was not this very small market of a limited number of executives, but a mass market of billions and billions of people. Something over two billion people. That is where the genes of Psion software is — in all the smartphones. That's the high ground it has, and that's its sucesss.

Q: But I can think of three. The digital radio, the iPod — 100 million- the SatNav system. Psion looked at all three, and only launched into one area.

You make your decisions and the world moves on. I think the issue on some of these areas was it was a question of whether we have the scale to deal with them across the world. It's an error to try and compete on the sense of scale of the entire world if you don't have that scale. It might be that our base in Britain and Europe wasn't big enough, while Americans had the advantage, during that period, of a much wider market.

It's also very difficult for outside companies, non-American companies, to break into that market — they're very possessive of their own. There's a networking effect in America. You can't quote me many examples of European companies that can have really broken in and dominated in an IPR area…

Q: I can think of individual products — the Dyson?

That's true. I think the world is changing. Lots of areas where it is different is the Japanese companies, who in many consumer electronic areas, dominate. The original science behind the LCD came from Britain, but it's to their credit that Japan and more recently Korea have invested these giant sums in producing them. The LCD is a marvel of today's world: a million cells on the screen and they all have to work — what an achievement. Especially when I think of the first Organisers.

Q: Do you wish you'd just stayed in that bit longer? One thing I noticed with Psion is it put in a lot of investment, and the first product wasn't always that great. But it stuck in there, and the successor product — the Organiser II, the Series 3a — was the hit, and created a new market. With hindsight you didn't reap the reward from those new 32bit platforms

Yes you're right, you have got to evolve like that and learn from the market all the time. I'm a great believer in the market.

That's to Steve Jobs' credit when he came back, he did that with the iPod. He took the Walkman and synthesised the whole thing down — into a disc based machine with a great library of music.

Q. Psion investigated doing an iPod, too — a "PsiPod". When you said you regretted withdrawing from consumer electronics too early — did you have that in mind?

One couldn't do everything forever. You had to deal with the reality and move on.

Q. One thing I notice today, the engineering values were quite different to what we see now on the internet. Software is supposed to be a service today, but these Web 2.0 sites can barely stay up. Now this is quite a contrast with Psion, where you never lost any data, and there was this almost moral imperative to wring the performance out of every byte. Was that something you tried to engender — directly or through the hiring?

During that time memory was expensive, remember. We were obsessive at the beginning when memory was a few kilobytes and we were obsessive with the Series 5 when there were many, many megabytes. It was a necessity particularly in a small device.

Perhaps it had to do with the culture I engendered in the company, which was perhaps a sort of Calvinistic culture. We have a set of values — one was the passion in the products for the market; we had to put our energy, skill and commitment into making really great products.

The other was frugality — frugality in terms of how we engineered things. We did so with quality but not over-engineering, while cost was very important to our markets; It's a fine balance.

Integrity was another of those core values. Integrity in engineering terms and in other ways. I think these were good values, and these are durable ones.

The core of the company really came from being contrarian — from not following the market wisdom. To be successful you need to be a bit contrarian. ®

Sir David Potter founded Psion in 1980, with £70,000 of his own capital; he resigned as CEO in 1999, but continues today as chairman. He is a non-executive director of the Bank of England.