

# Business model insights from five IP pure-plays

The sheer number and opacity of licensing models is mind numbing. A study of five publicly traded IP pure-plays reveals useful insights into what has made them successful licensors

By **Pat Kennedy**

To develop a strategy on how best to monetise my firm's six organically developed and essential internet-connected vehicle (telematics) patents, I researched long and hard for useful business models. Successful IP licensing firms exist by the thousands, but accomplishing a deep-dive analysis of both their histories and current business models proved extremely challenging. Gaining detailed insights into the business models and strategies of private patent licensing firms or patent pools was at best difficult, at worst impossible.

After much analysis, and a little help from a friend who is an IP sage, I concluded that the most reliable source of licensing models and strategies was publicly traded licensing firms. A closer look at these firms revealed that only a handful - Tessera Technologies, InterDigital, Mosaid Technologies, Rambus and WiLAN - mapped well to the position of my firm, US-based Cellport Systems, as an IP pure-play.

A few hundred hours later, I had pored over volumes of historical and current materials. A combination of government-mandated public filing disclosures, university case studies, stock analysts' reports and other published materials on the five firms yielded rich insights into a licensing market that is very secretive and opaque. Additionally, many enlightening perspectives were shared by former and

current executives of the five, as well as several equity analysts.

## **IP pure-plays share commonalities galore**

My study revealed numerous helpful findings - most notably, that all of the firms shared similar evolutionary patterns and business strategies that propelled their success. All of them created a handful of contiguous essential patents during their early launch years; they pioneered a vertical tech space and promulgated their contributions; all became hardware builders; and finally, they survived by licensing their essential intellectual property and then added to their portfolio by purchasing patents by the hundreds.

The number of historical and current similarities between Tessera, InterDigital, Mosaid, Rambus and WiLAN is striking:

- The founders were tenacious entrepreneurs with ambitions to deliver disruptive solutions.
- All of the firms' patented technologies were rooted in the semiconductor revolution.
- Their initial core essential patents were under a dozen and all organically and contiguously developed.
- Most of the essential patent accomplishments took place in a 15-year period between 1983 and 1998.
- Each firm had a period of hardware product sales or design package sales prior to shifting to the IP pure-play model.
- Targeted technology segments were in greenfield market opportunities.
- Surviving near-death experiences with bankruptcy was a common thread.
- Early licensing successes benefited from undisputed pioneering IP contributions.
- Many of the early essential patents have expired or are nearing expiration.



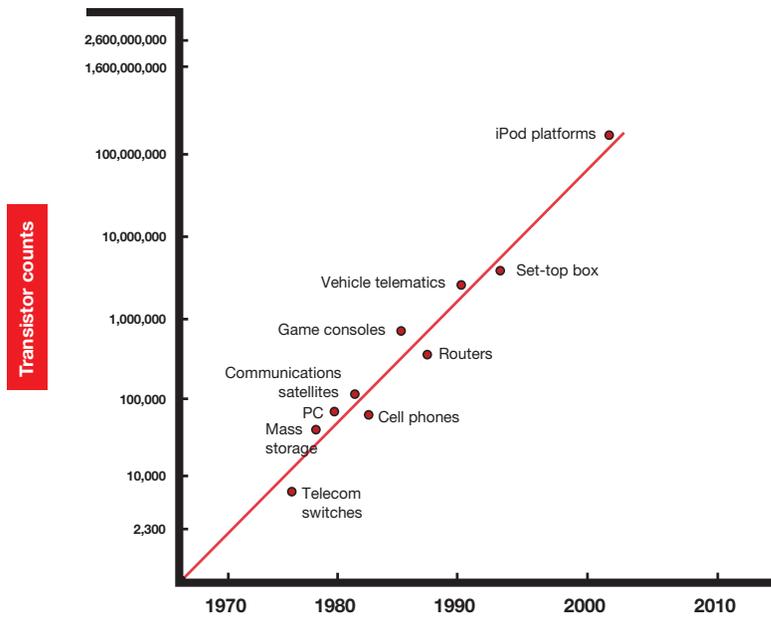
countless reasons. Indeed, because of the many thousands of firms that failed, Tessera, InterDigital, Mosaid, Rambus and WiLAN should, at a minimum, be admired for their survival skills. The dozens of tech companies that did survive as mega hardware brands developed enormously successful franchises, each of which is worth tens of billions of dollars in sales. Spectacular growth of hardware platform unit sales was turbo charged by the adoption of software platforms, computer-aided design-enhanced chip solutions, the allocation of vast amounts of wireless spectrum for cellular and Wi-Fi services and the opening of the Internet for public use. The semiconductor revolution delivered another gilded age of wealth creation and continues to reshape our economy running at Internet time speeds.

All five pure-play IP firms have beaten the odds of surviving the white-water world of electronics and have also shown many parallel paths in their stages of business maturity. These firms now face a new set of obstacles in the greying electronics market. Some of their organically developed essential patents have already expired and the balance will expire during this decade. Obtaining essential patents in the technology spaces of silicon semiconductor designs and system platform designs is much less likely today, due to the patent thicket in semiconductor and hardware platform designs. Additionally, the plethora of standards bodies today are dominated by market incumbents that work to socialise innovation development away from disruptive innovators. These bodies are yet another tell-tale sign of a greying market. Consequently, the silicon-based electronics market that was bountiful with greenfield opportunities and ripe for disruptive innovations, which the five firms historically delivered, is vastly less fertile ground today. Figure 3 shows the evolution of silicon densities and hardware platforms created in the greenfield days of a young semiconductor market.

**Success begets big challenges**

Average annual licensing revenues for the five firms have grown at an impressive rate of 26% over the past five years, and have enabled the build-up of liquid assets that now exceed US\$1.7 billion cumulatively. The amount of cash-like assets on the balance sheets of these companies exceeded cumulative revenue in 2010 by a comfortable 51%. Over the past decade, all five firms have used their strong cash positions to purchase patents in their respective vertical tech space. These patents serve as a hedge against

Figure 2. Semiconductor hardware platform introductions and transistor densities



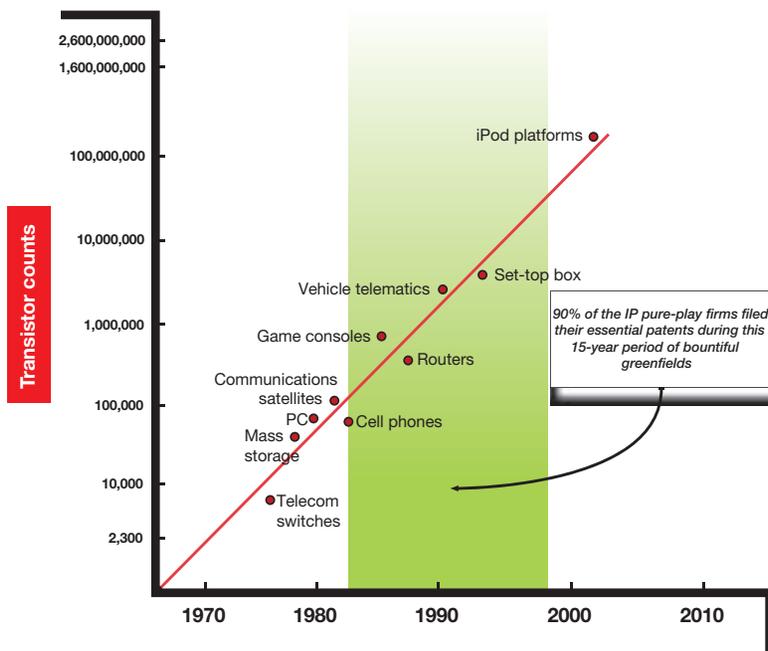
the firms' ageing organically developed essential patents, while enabling them to create an additional market contribution as patent aggregators. This patent aggregation role appears to be a true 'value-add' with licence renewal successes. Over the next decade we should have a clearer picture of how long a patent aggregator service strategy will last in the greying electronics market.

Tessera, InterDigital, Mosaid, Rambus and WiLAN have rightfully concluded that one of their core competencies in their Stage III phase is licensing management. Thereby, to further leverage their respective licensing strengths and for market diversification purposes, all of the firms strayed from the vertical market of their founding and acquired other portfolios. The most popular areas for new portfolio accumulation have been the markets of display, optics and lighting technologies, all utilising semiconductor-related advancements.

**Ill-fated ambitions in new vertical markets**

Early evidence indicates that the firms reap less impressive financial results from diversifying into a non-organic patent market than from licensing revenues garnered from the organically developed essential patents created by the early founders during the greenfield days. Moreover, these firms are facing increased

Figure 3. Greenfield days of semiconductor designs and hardware platforms



plaintiff litigation costs from five years ago. It appears that the growth in litigation expenses stems from some licence renewal challenges, but most are lawsuits related to asserting the non-organically developed patents acquired for diversification purposes. The diminished licence size and high enforcement costs of non-organic patent assertions are two troublesome scenarios. Maybe all of these lawsuit filings are needed to establish alpha licensing success in new vertical markets, although they may also be indicators of strategy and value-added shortcomings.

From both my own experience at Cellport and observations studying the five firms, overwhelming evidence reveals that it is easier to accomplish licensing leadership in a vertical tech space of organically developed essential patents created to advance a one-time greenfield market of innovation design. Large mega hardware producers shrewdly avoid facing essential patent inventors at the negotiation table who are passionately explaining their invention histories and eager to tell the courts how they got 'ideajacked'. However, when patent pure-plays stray from the vertical tech spaces that they helped to pioneer, the portfolios that they acquire from other vertical tech spaces yield less impressive results. Lower licensing amounts from the acquired portfolios — often looking more like troll settlement rates of US\$2 million or less —

are vastly under the historic licence agreements in the tens of millions of dollars from the firms' organically developed essential portfolios.

Clearly, IP licensing competencies, good cash flow and significant balance-sheet cash are all high on the list of impressive assets within each firm. Today's strategies of incremental patent filings and purchasing patents as a gross aggregator in the respective founding vertical markets should continue to deliver high-margin IP-licensing cash flows. But the current strategy of diversifying into other silicon-based semiconductor electronic markets via acquiring portfolios seems unspectacular. There may be better and bolder opportunities for investing cash and using skilled human licensing capital than on the assets of a greying electronics market.

#### Lessons from Big Pharma

The large pharmaceutical companies faced a similar 'greying horse' problem over the past decade, often trimming internal R&D investments in chemistry labs due to the steep drop-off in blockbuster drugs such as Lipitor (Pfizer), Seroquel (AstraZeneca) and Plavix (Sanofi-Aventis), which are also soon coming off patent. A low yield in maturing market investments in the traditional science of compound chemistry, coupled with ageing patent portfolios, forced the big pharmaceutical firms to shift innovation gears. When they realised the magnitude of the innovation crisis, the pharmaceutical giants became eager investors in the greenfield markets of biotech. In the 1980s and 1990s biotech firms were considered fringe opportunities with risky prospects. But as sales and profits at Amgen, Genentech and Genzyme exploded, the fringe biotech people became the sought-after disruptive darlings of Big Pharma's ambitions. As biotech provided Big Pharma with more new products for distribution, the race to acquire and invest in young and disruptive biotech firms was on.

#### The future: finding disruptions in greenfield markets

If the founders of Tessera, InterDigital, Mosaid, Rambus and WiLAN had launched their firms with the licensing strategy and closing skills that exist in today's Stage III pure-play organisations, they would likely look more like a Qualcomm. Irwin Jacobs, Qualcomm's founder, sold his previous firm, Linkabit, in the mid-1980s, but because Linkabit owned very little of the intellectual property it developed, the sale price was a disappointment to Jacobs. Hence, in his next

company, Jacobs inspired innovation through his visionary leadership and Qualcomm became known for its voracious patent filings and world-class licensing prowess.

Given the fabulous cash reserves and licensing skills of Tessera, InterDigital, Mosaid, Rambus and WiLAN, a 'disruption tech division' targeting future greenfields could yield more spectacular returns than buying patents in other electronic vertical tech markets and trying to license into a maturing market loaded with prior art.

I am not recommending that these firms transform into prototypical venture capitalists, but that they develop new competencies (Stage IV) for finding greenfield disruptors and creating the next Amgen or Qualcomm. Learning how to fund and empower disruptive thinkers on frontiers of the material sciences would be good for their image and the world and, if successful, would deliver outlier returns. Scant few cash-rich investment vehicles have the IP-skilled human capital to architect vital IP optimisation. Tenured licensing skills could likely parlay significant advantages to disruptive innovators in greenfield markets. As Big Pharma has learned, disruptive breakthroughs are best created and grown away from a maturing corporate entity.

**An overview of the five IP pure-plays**

Following are brief summaries of the histories and major products offered by the InterDigital, Tessera, WiLAN, Mosaid and Rambus.

**InterDigital (NASDAQ:IDCC) - vertical tech space: cellular**

The company was started in 1972 by Sherwin Seligsohn, a successful young Wall Street banker who had a vision of delivering stock quotes to beach vacationers. The impossibility of delivering on Seligsohn's vision challenged his entrepreneurial instincts, so he founded InterDigital to build his wireless visions. After much system design progress and a successful initial public offering in the early 1980s, InterDigital sold its Ultra Phone system to over 300 system operators worldwide. Unfortunately, the Ultra Phone design was two semiconductor generations behind cellular and it quickly became a dated technology.

By the late 1980s, the success of cellular doomed Ultra Phone, and InterDigital experienced years of white-water challenges as it shifted from product ambitions to a Stage III organisation. Redirecting its wireless design resources towards patent

Table 1. Summary of InterDigital's financial performance (US\$)

	1995	2000	2005	2010
Licence revenue	67.393M	51,244M	144.100M	370.200M
Other revenue	17.262M	5,634M	19.025M	24.345M
R&D % of revenue	14.33%	46.00%	43.79%	18.12%
Pre-tax profit	40.436M	9.299M	20.251M	238.447M
Cash & short-term investments	64.487M	88.987M	105.708M	541.669M

Table 2. Summary of WiLAN's financial performance (C\$)

	1995	2000	2005	2010
Licence revenue	Pre-IPO	1.116M	0.44M	46.895M
Other revenue		62.275M	24.3M	3.830M
R&D % of revenue		11.81%	36.649%	7.438%
Pre-tax profit		(18.038M)	(25.774M)	(20.772M)
Cash & short-term investments		13.852M	3.706M	107.015M

Table 3. Summary of Tessera's financial performance (US\$)

	1995	2000	2005	2010
Licence revenue	Pre-IPO	Pre-IPO	56.930M	279.623M
Other revenue			37.77M	21.77M
R&D % of revenue			7.870%	24.585%
Pre-tax profit			49.128M	100.821M
Cash & short-term investments			127.594M	475.005M

opportunities with time-division multiple access (TDMA), the technology used in most 2G cellular systems, in the early 1990s it then acquired SCS Mobilecom's goldmine of essential code-division multiple access (CDMA) patents, which were ironically developed by the Jacobs-led design team at Linkabit in the mid-1980s.

Efficiently, InterDigital followed the Motorola, Nokia and Ericsson licensing successes in the TDMA market and did the same in CDMA after Qualcomm delivered a viable ecosystem. Although InterDigital has suffered litigation setbacks and enforcement delays, its licensing successes with Asian firms appear to have some degree of design and other synergies.

Today, the company invests tens of millions of dollars to advance wireless designs, and is active in technology standards bodies and in purchasing additional patents. With a wireless-centric patent portfolio in the thousands, InterDigital has created and purchased enough wireless intellectual property to be considered a leading wireless aggregator.

Table 4. Summary of Mosaid's financial performance (C\$)

	1995	2000	2005	2010
Licence revenue		47.044M	49.743M	71.110M
R&D % of revenue		39.219%	15.359%	4.182%
Pre-tax profit		2.830M	13.974M	33.421M
Cash & short-term investments		31.147M	65.864M	97.809M

Table 5. Summary of Rambus's financial performance (US\$)

	1995	2000	2005	2010
Licence revenue	Pre-IPO	32.628M	26.876M	320.155M
Other revenue		39.683M	130.322M	3.235M
R&D % of revenue		15.90%	15.10%	28.667%
Pre-tax profit		(138.794M)*	38.761M	208.044M
Cash & short-term investments		122.220M	160.807M	512.009M

\* This loss is an anomaly. The company paid US\$171 million in employee stock-related expenses. Its previous year pre-tax profit was US\$13.8 million.

Given the current wireless patent thicket of commingled technologies, the big shift in wireless superpowers makes for directional uncertainty at InterDigital. Will InterDigital be acquired for its cellular patents or stay in the business of an IP pure-play and work to build a Stage IV organisation?

#### WiLAN (NASDAQ:WILN, TSE:WIN) - vertical tech space: wi-fi airlink

In the late 1980s Hatim Zaghoul, an Egyptian immigrant with a recently minted PhD from the University of Calgary, brought a fresh set of eyes and energy to the wireless labs of a well-endowed telephone monopoly in western Canada called Telus Communications. After Zaghoul showed vision and leadership in wireless system designs at Telus, he received funding to launch a research project called "Network Living".

Zaghoul wasted little time in recruiting university friend Michel Fattouche as a research colleague. Given the variety of challenges with TDMA, Zaghoul and Fattouche focused on pushing the envelope with wireless air interface experiments. While trying to improve on TDMA cellular network challenges, the researchers developed meaningful improvements in orthogonal frequency-division multiplexing (OFDM), an Airlink scheme for wideband digital communication such as wi-fi. By 1991 Zaghoul and Fattouche had ideas for significant advancements in OFDM technology; but Telus did not want to

propose yet another cellular standard in the already fractured North American market. In 1992 Telus set Zaghoul and Fattouche free to develop OFDM in their own company, WiLAN.

During the first five years of WiLAN's history, Zaghoul and team built an impressive portfolio of contiguous essential patents on making OFDM technology a robust commercial platform. Zaghoul was the chief visionary and tireless promulgator of the virtues of OFDM as a low-power, high-data bandwidth wireless technology. He took full advantage of the patent system, and as soon as a new design was filed, he lectured broadly on the benefits of WiLAN's OFDM advancements.

Symbolically, in 1998, when the Institute of Electrical and Electronics Engineers assembled a standards body to finalise what would become Wi-Fi Standard 802.11, many of WiLAN's essential patents got adopted in the standard, yet WiLAN never sent a representative. Like the other IP pure-plays, WiLAN chose to enter the product business with a commercial launch in 1998, followed by an IPO in 2001. As WiLAN's product-business prospects diminished, the use of its essential patents by other firms in the burgeoning Wi-Fi market presented a Stage III challenge. By 2005 WiLAN began a politically rancorous restructuring process and turned itself into an IP patent pure-play. Early licensing efforts were successful and after several additional equity fundings, WiLAN bought more wireless patents, along with some cable transmission technology and sensor patents. WiLAN has had less success in signing meaningful licensees outside of its organically developed area of wi-fi-centric patents. The company's recent failed attempt to buy Mosaid leaves it poised for a new strategy. Because the firm has over C\$100 million in cash-like assets and an assertive licensing organisation, WiLAN's strategy is sure to evolve.

#### Tessera Technologies (NASDAQ:TSRA) - vertical tech space: chip packaging

In 1990 Tom DiStefano and Igor Khandros left IBM's chip research centre to start a design consulting firm with a keen eye towards developing innovative solutions in the nascent semiconductor production and packaging world. By providing consulting services to keep the doors open, Tessera was able to fund its first prototype chip-scale packaging system after seven years. This long and difficult development cycle gave Tessera's talented engineering team time to solve many challenges and in turn build an impressive portfolio of contiguous patents in

the greenfield technology market of chip packaging.

After six years of toil, a blockbuster sales coup landed Tessa its first customer: Intel's sizable flash production division. The Intel contract, followed by a win with Rambus, helped to position Tessa to gain better market access and respect among Asian memory chip producers. A public offering in 2003 infused nearly US\$100 million into Tessa for its second decade of opportunities.

Tessa has reported impressive royalty growth numbers and invests heavily in chip and non-chip research, along with patent purchases. To shore up its ageing chip-scale packaging portfolio, Tessa bought a chip-packaging design firm's intellectual property in 2005. Then, for what appears to be market diversification ambitions, the company spent heavily on large patent portfolios to build competencies in imaging and optics, and dedicated R&D funds to this space. Tessa's average licence agreement from its image and optics portfolio has been markedly below US\$2 million per licensee.

Tessa has made an interesting bet on creating disruptive leadership in a field such as electro-hydrodynamics. With the firm's 2011 performance down, recent management changes at Tessa appear to be diminishing the imaging and optics business, and if electro-hydrodynamics shows greenfield-like promise, the firm may pioneer yet another market. Although ageing, Tessa's unique and deep portfolio of essential patents in chip-scale packaging should provide positive cash flow for years to come. With nearly US\$500 million in cash or equivalents on the balance sheet, good engineering and licensing skills, Tessa remains impressive.

**Mosaïd Technologies (TSE:MSD)(now private) - vertical tech space: memory chips**

In the late 1960s Dick Foss and Bob Harlan became friends while working in a transistor chip lab at Plessey Electronics. Dissatisfied with UK labour rules that favoured draftsmen over engineers, they moved to Canada and joined Nortel's ambitions to advance memory chip designs. By 1975 Nortel realised that the company's bureaucratic roots were incompatible with the rapidly advancing chip business and scuttled the business. Freshly unemployed, the two Plessey mates once again took a fresh approach and founded Mosaïd. Mosaïd started by anointing itself as the technical ombudsman in the nascent and burgeoning memory chip business. With cutting-edge insights into the rapidly evolving world of dynamic random access-memory (DRAM)

chip developments, Foss and Harlan sold subscriptions to their analytics-rich DRAM research reports. By the late 1970s their analytics work led them to develop a family of DRAM test equipment, which became a branded product line that delivered growing revenues and analytics level insights for chip design innovations.

Mosaïd's own DRAM design advancements were first filed with the patent office in the mid-1980s and then promulgated to its subscribers in the memory chip business. The insights garnered from being an industry ombudsman and in the test equipment business enabled Mosaïd to build up contiguous essential DRAM patents in the 1980s and SDRAM designs in the 1990s, which provided Mosaïd with unique IP strength.

Mosaïd's growing test equipment product line delivered profits and design synergy, but created relationship obstacles for patent licensing. In 2005 a Wall Street hedge fund forced a shake-up of the board of directors, and a year later Mosaïd divested its branded test equipment business and became an IP pure-play of its organically developed essential patents in the memory chip business. Over the past five years, both Mosaïd's build-up of licensing skills and its revenue from memory chip licences have been impressive. The early results from its purchase of wireless patents have been predictably less so.

Shortly after Mosaïd consummated a licensing management agreement with Nokia and Microsoft for a large portfolio of wireless patents, it received an unsolicited acquisition offer from WiLAN. After a series of deft, chess-like moves by Mosaïd's management, private equity investor Sterling Partners purchased the company for a sum over eight times Mosaïd's revenue.

**Rambus (NASDAQ:RMBS) - vertical tech space: memory chips**

In 1990 Rambus founders Mike Farmwald and Mark Horowitz proposed numerous design ideas that resulted in contiguous essential patent filings for increasing the communication speed between a circuit board's primary microprocessor and a new generation of DRAM chip design. Rambus was a classic Silicon Valley start-up; within a few years venture capitalists owned over 50%, kept engineering focused on development and brought in MBAs to drive marketing and run the company. After years of further developments and evangelising the benefits of Rambus's high-speed memory access technology, in 1996 Intel signed a strategic investment and adoption contract

**Action plan**



For a Stage IV IP pure-play with an interest in allocating licensing executive resources and cash to the high-risk world of disruptive inventions, the following recommendations might be considered:

- Allocate a percentage of balance-sheet cash to fund disruptive technology projects in greenfield markets.
- Market the firm's licensing competencies along with its ability to co-invest in a variety of research communities.
- Create investment and strategic IP offerings to help investment funds transition a disruptive tech jewel into the next Amgen or Qualcomm; IP licensing skills along with co-investing provide a unique combination of value that should provide access to prime investment opportunities at various investment funds.
- Attend meetings on innovative thinking and disruptive ideas.

that sent shockwaves through the DRAM chip markets. Within a year of the Intel agreement, Rambus went public and raised US\$37 million to help it scale up for a global rollout of Rambus technology to Intel's memory chip suppliers.

The terms of a Rambus licence were both strict and relatively expensive for the commodity chip makers. Rambus's terms led to clandestine and some not-so-secret revolts in favour of alternative solutions. The higher-speed memory chip design alternatives that emerged caused Rambus to file patent violation suits against a variety of DRAM producers. Starting in 2000, Rambus began convincing a few litigation opponents that its core intellectual property was essential to both the faster DRAM designs and the company's proprietary Rambus RDRAM platform.

Rambus litigation and standard bodies' challenges over the past decade would be good fodder for a Tom Clancy novel. Despite 10 years of legal challenges, in 2010 Rambus collected over US\$300 million in licence revenues, the vast majority coming from its

memory chip IP portfolio. In recent years Rambus has used a large portion of its cash to diversify out of memory chips by purchasing sizable patent portfolios in the vertical tech markets of lighting, displays and cyber security. With its historic memory chip patent business facing legal challenges, Rambus has bet big on non-memory chip IP markets and will try to exercise its formidable licensing skills in these other areas of growth. *iam*

**Pat Kennedy** is a founder and chairman of Cellport Systems in Boulder, Colorado. The company was founded in 1993 and is a privately held IP pure-play with six essential vehicle patents in the vertical tech space called vehicle telematics; it has licensed to over a dozen firms. Mr Kennedy is a board member of the Centre for Human Capital Economics and the author of *IdeaJacked: An Entrepreneur's Story of Innovation and Treacherous Competition in Global Markets* (2009)

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