



ASX PRESS RELEASE

21 April 2016

INVESTOR PRESENTATION

The Directors of BrainChip Holdings Ltd (“**BrainChip**”) are pleased to release the attached Investor Presentation.

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brainchip*

ASX: BRN

Investor Presentation

April 2016

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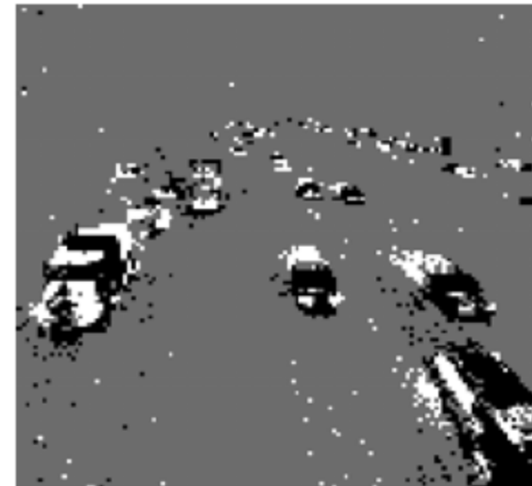
**The Next Generation of Fast, Autonomous
Machine Learning**

Overview



BrainChip has developed a revolutionary Spiking Neuron Adaptive Processor (SNAP) technology that learns autonomously and unsupervised, evolves and associates information just like the human brain

- * SNAP technology provides rapid and autonomous learning, confirmed in the Autonomous Visual Feature Extraction demonstration in March 2016
- * SNAP is deployable across multiple fast-growing markets
- * BrainChip follows a proven Semiconductor industry Intellectual Property (IP) licensing model in deriving its revenue from License, Engineering and Royalty fees

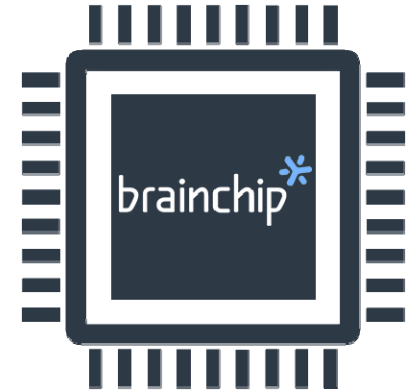


ASX Code	BRN
Market Cap (April 14 2016)	A\$127.1M
Share Price (April 14 2016)	A\$0.18
Issued Shares	706.38M
Options	29.55M
Cash (March 31 2016)	US\$803,000

SNAP's Unique Features



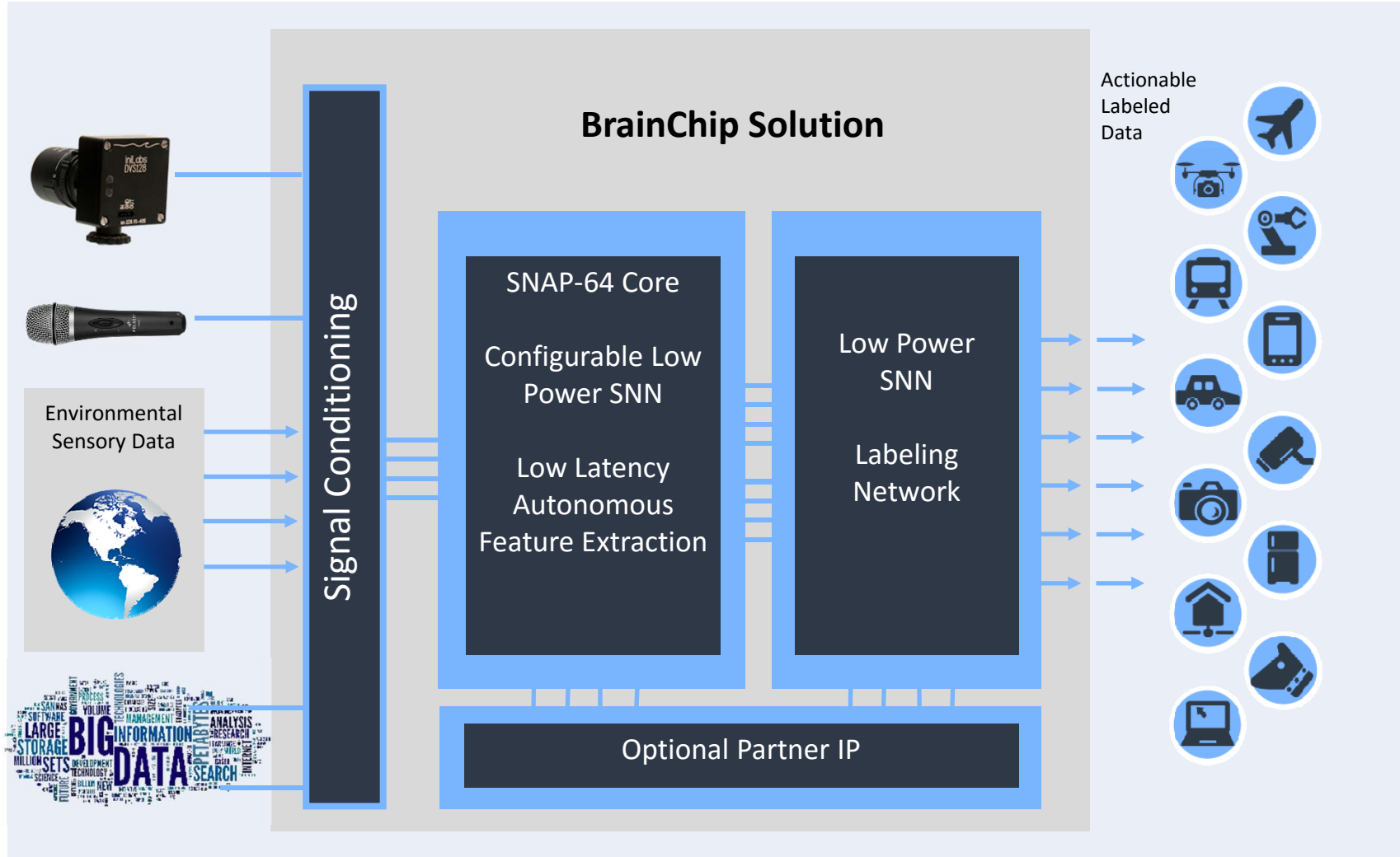
- ✧ **Next Generation rapid real time learning**, learns autonomously within seconds
- ✧ A revolutionary custom **digital hardware design**, no traditional processing core, no firmware, no external memory
- ✧ **Real time recognition** at very **low latency**
- ✧ **Massive parallel execution** - all neural nodes are updated at the same time, enabling a **speed thousands of times faster than peer software neural networks**
- ✧ Performs **consistently at exceptionally high speed** and does not slow down with network size
- ✧ **Significantly lower power consumption** enables large networks to be integrated into portable devices



SNAP Solutions Block Diagram



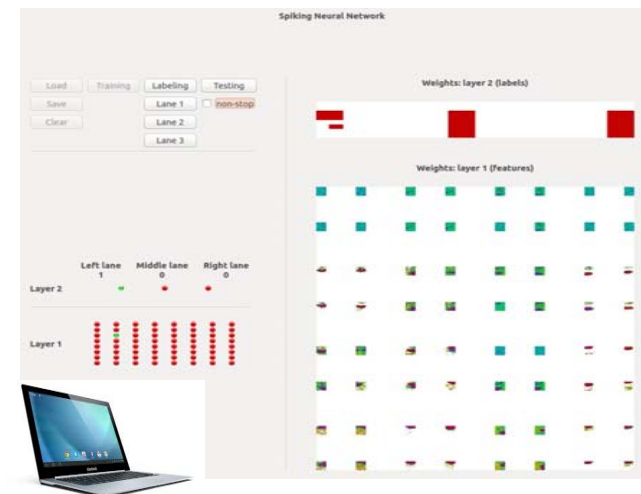
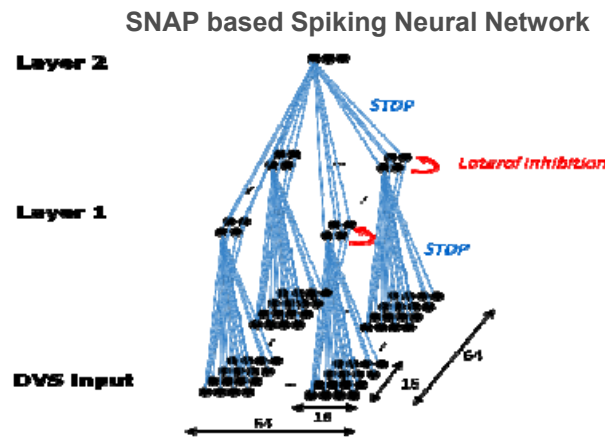
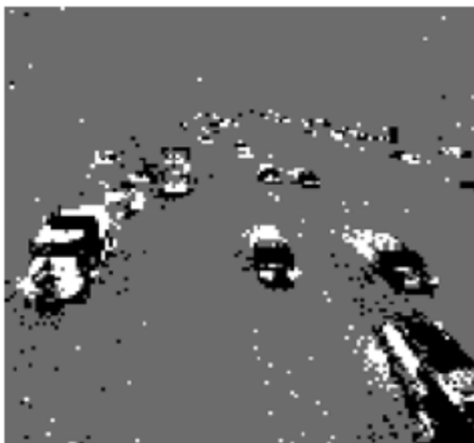
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Unsupervised Learning – The New Frontier

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- 15 March 2016 – Release of Milestone 3 the Autonomous Visual Feature Extraction Neural Network with a Client / Server Application tool
- Demonstrated SNAP based Real Time Pattern Learning and Recognition working in a chip (FPGA) hardware
- Autonomous and Unsupervised Learning at 1Mhz matching camera time resolution
- [Milestone 3 AVFE Video Demo:](#)



Leading The Next Generation



Next Generation: Rapid Real Time Learning

- Requires a small sample set
- Learns within seconds
- Autonomously learns and extracts features



Previous Generation: Deep Learning

- Requires millions of samples
- Learns features in days or weeks

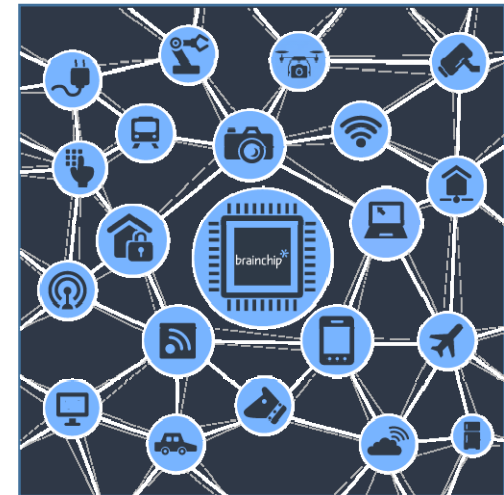
SNAP is a standalone fast machine learning technology capable of accelerating a technology-partner's existing deep learning solutions

Market Opportunity



- * The Neuromorphic Chip Market is estimated will be worth **\$4.8 billion by 2022 with a CAGR of 26.31%***
- * License opportunities and related revenues are significant and highlighted in slide 15
- * Neuromorphic sector and **Artificial Intelligence** have been seeking SNAP's capabilities
- * SNAP IP is a core enabling technology in Neuromorphic semiconductor chips
- * Neuromorphic chips can be used in nearly any smart application or product – a massive and unlimited market

- Smartphones
- Internet of Things (IoT)
- Drones; hazard avoidance, mapping
- Gaming
- Security and Cyber Security
- Driverless Vehicles



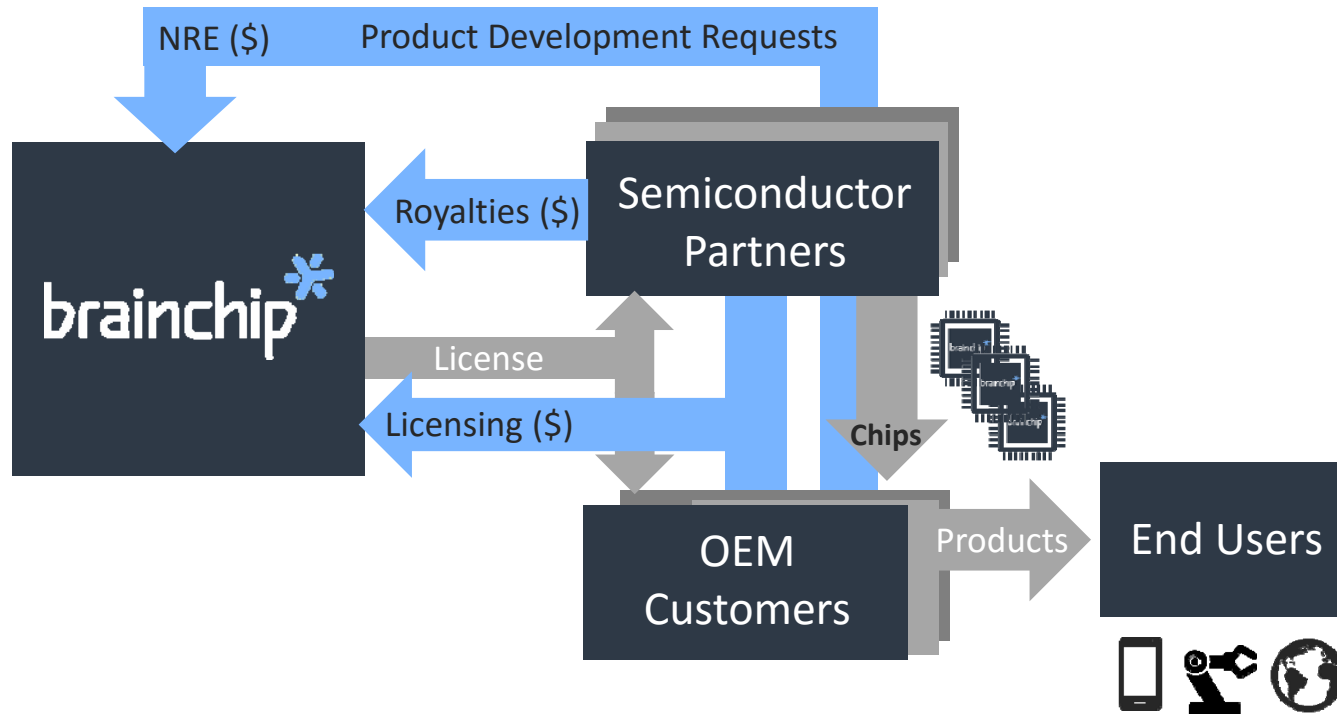
*Source: Markets and Markets 2015 Report

Commercialisation Strategy



- ✧ Grow a network of **technology partners**, and **OEM customers** for licensing and to satisfy growing needs in **Artificial Intelligence and Business Intelligence**
- ✧ Create high tech products that **integrate into** technology partners **solutions** to grow new markets
- ✧ Launch **BrainChip Development Kit (BDK)** to empower large numbers of laboratories to apply and license SNAP technology
- ✧ Build a broad portfolio of **global patents**
- ✧ Potentially **spin out application-specific JVs** and/or subsidiary companies if partnering with major corporations
- ✧ Become the **de facto standard** for **autonomous learning**

Business Model

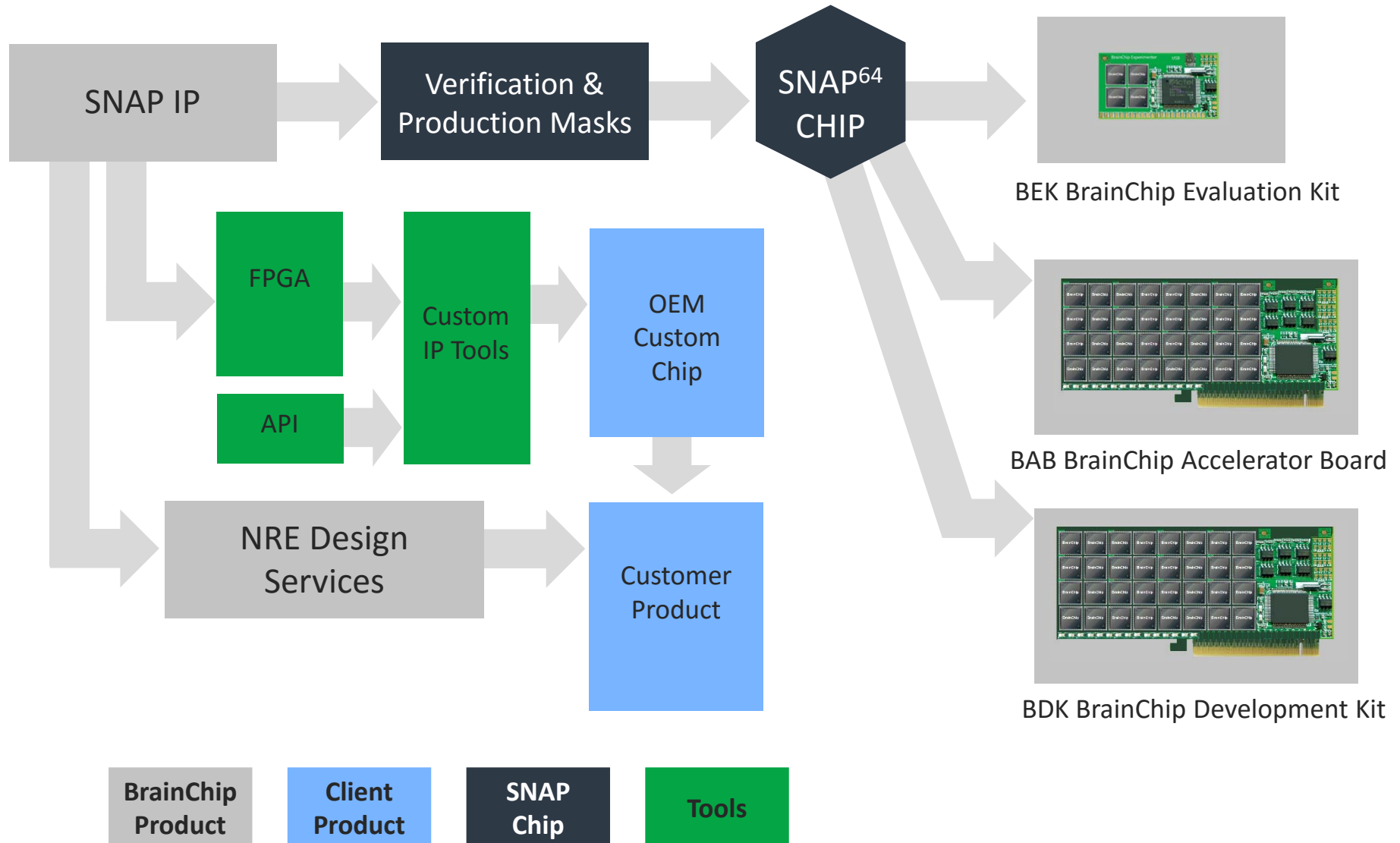


Three Revenue sources:

- 1) **Licensing Revenue** – SNAP licensed to OEM customers and semiconductor companies.
- 2) **NRE Revenue** – Semiconductor company designs and manufactures a specific chip utilizing SNAP with other technologies. The chip is incorporated into a product and sold. BrainChip technical team will generate service income in customizing SNAP to the client application
- 3) **Royalty Revenue** – Royalty for every chip sold, based on percentage of chip price.

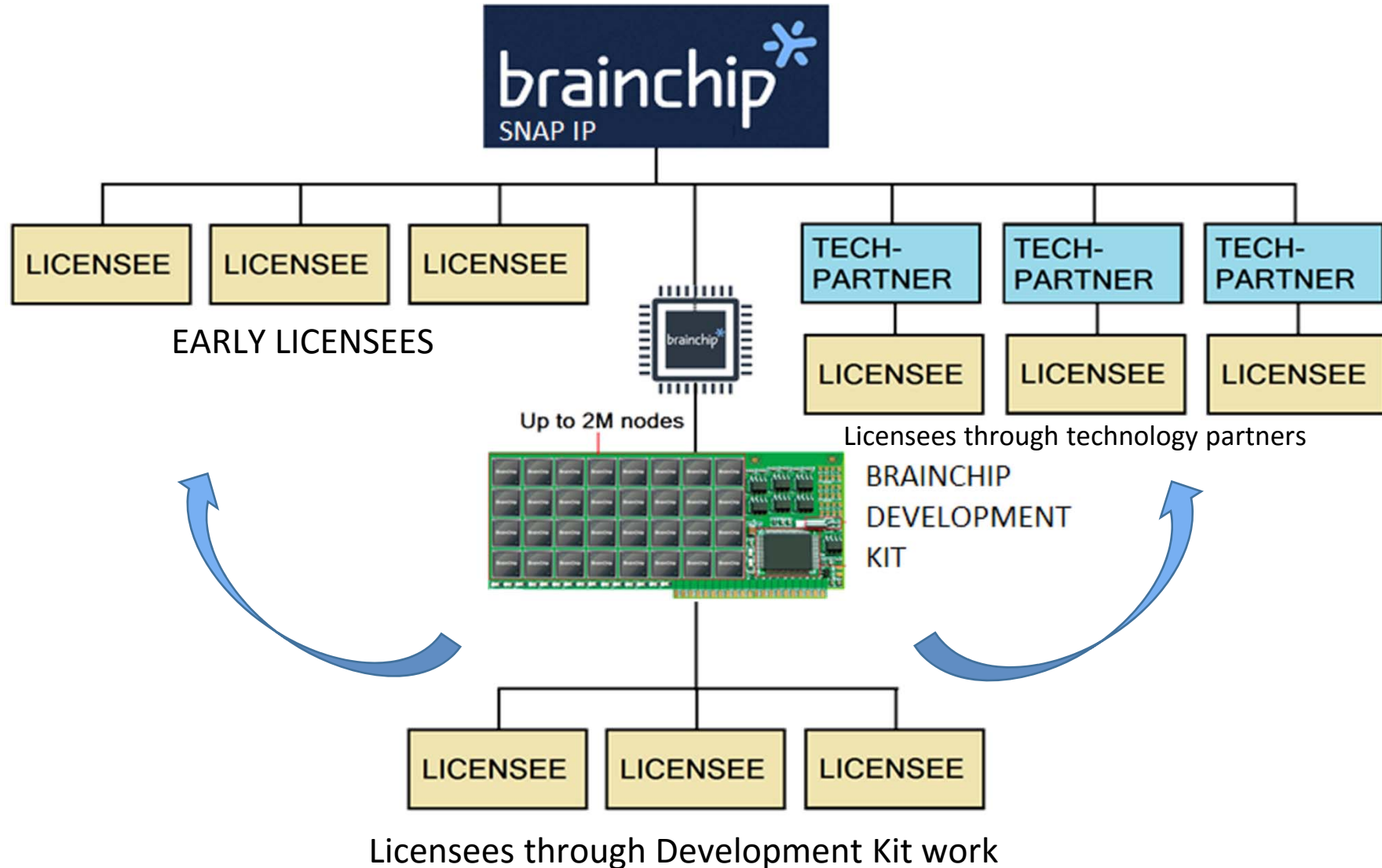
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Product Offerings



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SNAP BDK – Marketing Tool



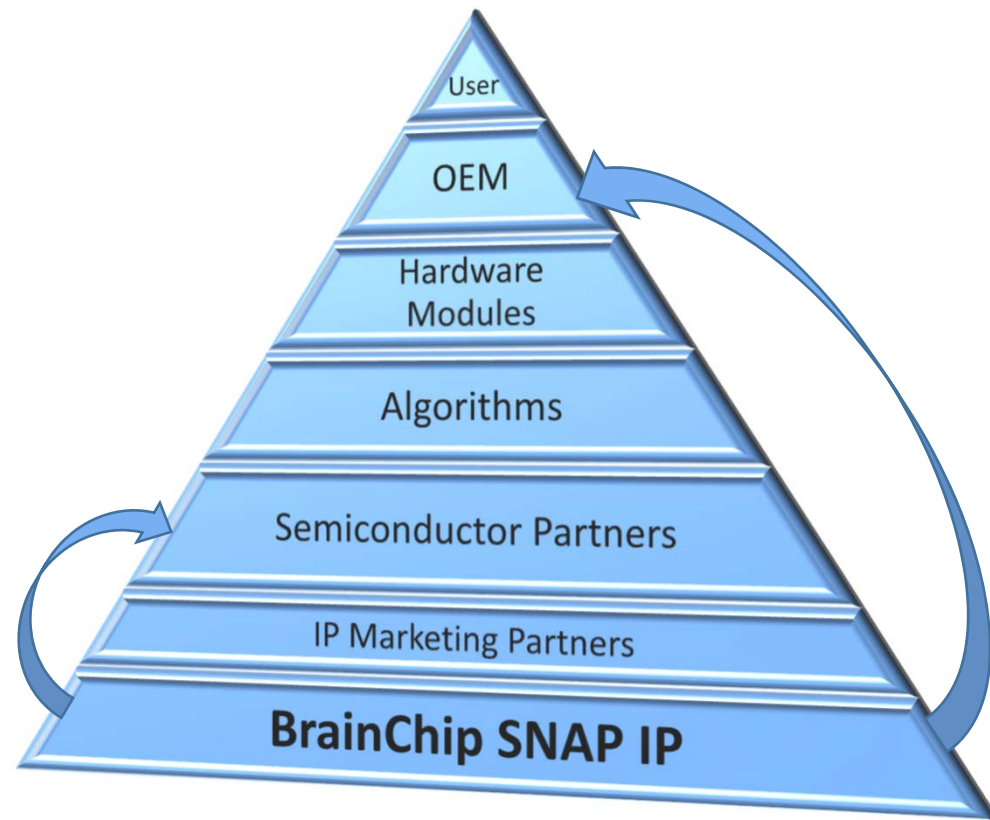
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Multiple Channels to Market



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OEM Customers	<ul style="list-style-type: none">• Cell phones• MEMS• Security• Robotics
Hardware & software module solution providers	<ul style="list-style-type: none">• Work with semiconductor partners to complete the solutions
Semiconductor Partners	<ul style="list-style-type: none">• License SNAP and manufacture system on chip products for OEMs
BrainChip SNAP Sales Model	<ul style="list-style-type: none">• Direct Sales to identified customers• Joint marketing• IP sales/ distributor partners



Marketing Strategy - Partners



TECHNOLOGY
RAPID LEARNING NEUROMORPHIC IP

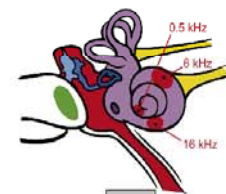
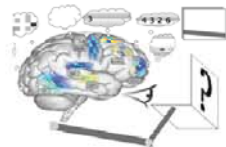
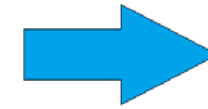


T.B.A. PARTNER

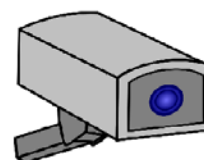
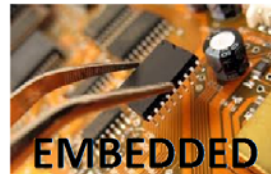
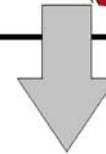
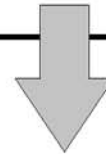
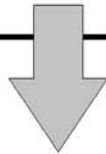
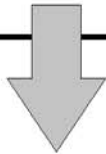
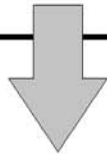
T.B.A. PARTNER



T.B.A. PARTNER



Future Partners...



Projected to reach USD 21.23 billion by 2020
mordorintelligence.com

expected to reach USD 233.13 billion in 2021
transparencymarketresearch.com

expected to reach USD 5.59 Billion by 2020
marketsandmarkets.com

grow from \$2.77 Billion in 2015 to \$6.19 Billion by 2020
marketsandmarkets.com

now worth 1.56 Trillion dollars annually
<http://communities-dominate.blogspot.com/brands/>

from nearly \$39 billion in 2015 to more than \$76 billion in 2020
Researchandmarkets.com

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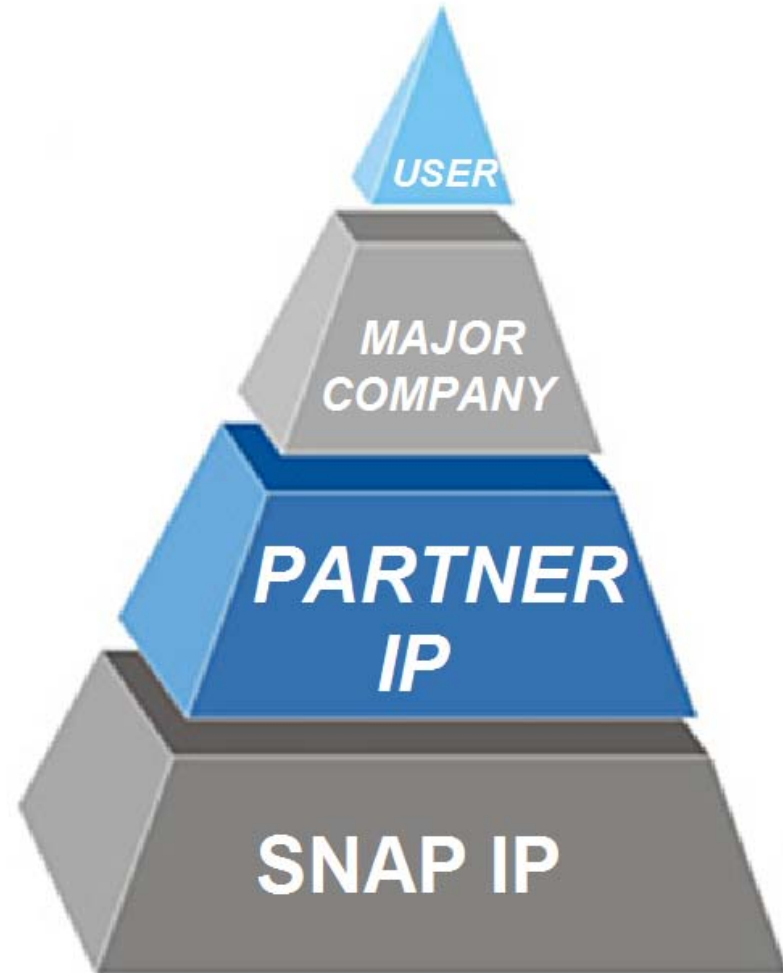
Marketing Strategy - Direct

The end-user benefits from BrainChip SNAP solutions through products that augment life, intelligent prosthesis, learning machines, safety systems

Major companies, like the Fortune-500 can apply the complete solution offered by BrainChip SNAP and its partners rapidly, providing a strategic advantage

Partner IP provides the 'glue' to apply the BrainChip SNAP IP to a complete turn-key solution that is applied to an existing, unsolvable problem.

The BrainChip SNAP IP provides high speed learning, fast recognition, low power consumption, reduced footprint



Competitive Landscape



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	Companies	Degree of parallelism (speed)	Low power consumption	Chip designed for neural networks	Rapid Learning capabilities on chip	Execution time independent of neural network size	Uses third generation neural networks (spiking)
Hardware - Chip	BrainChip (SNAP)						
	IBM (TrueNorth)						
	Qualcomm (Zeroth)						
	Cognimem						
Deep Learning	DeepMind (Google)						
	Facebook						
	Vicarious General Vision						
	Tera Deep						
Robotics	Brain Corporation						
	Neurala						

each quadrant represents 25% CAPABILITY

Simplified Neuron model

This table contains commercially available products and announced products. It does not list a range of analog VLSI devices that are developed by Stanford, UCSD, Salk Institute and others because these are research devices. Analog VLSI are difficult to mass-produce.

IP Protection



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- * Protecting and developing intellectual property is a central part of BrainChip’s business strategy
- * BrainChip is the first company to file a digital neuromorphic chip patent (2008)
- * Citations of BrainChip’s patents are accelerating – a leading indicator for a growing market
- * **1 patent granted** – Autonomous Learning Dynamic Artificial Neural Computing Device and Brain Inspired System: 8,250,011 cited multiple times
- * **5 patents currently pending and many more planned**

Leading Companies Citing BrainChip ¹	Cites
Qualcomm	13
IBM	9
Samsung Electronics	1
Others	2

¹Partial list. U.S. patents and cites are as of December 31, 2015.



Board and Management



Mick Bolto
Non-Executive
Chairman

- Mick was a partner at leading global law firm Mallesons Stephen Jaques for 20 years, in the structuring & execution of large-scale transactions around the world. Has since worked in private equity fundraising & investment supervision, creating strategy & helping to deliver viable business results. Mick has been Chairman of numerous listed, private & not-for-profit entities.

Peter AJ van der Made
Founder, CEO & CTO

- At the forefront of computer innovation for 40 years. Designed high resolution, high speed color Graphics Accelerator chip for IBM PC graphics. CTO at vCIS Technology where he invented a computer immune system & became Chief Scientist when it was acquired by Internet Security Systems, & subsequently IBM. In 2010 published Higher Intelligence, a book describing the architecture of the brain from a computer science perspective.

Anil Mankar
COO & SVP Engineering

- 30 years as a developer in the semiconductor industry. At Western Digital he developed PC core Logic chipsets. He started as VP Engineering at Conexant Systems Inc and developed many products across industry segments then became CDO overseeing product development for V92 Modem, DSL, Set-top boxes, PC audio and video 'System on a Chip' products. Moved to be SVP of VLSI Engineering at Mindspeed Technologies, responsible for Wireless and VOIP infrastructure product development.

Neil Rinaldi
Non-Executive Director

- Corporate background with an emphasis on M&A, capital raising & business development.

Dr. Adam Osseiran
Non-Executive Director

- At BrainChip since 2012. Currently Associate Professor of Electrical Engineering at Edith Cowan University in Western Australia and holds a Ph.D. in microelectronics from the National Polytechnic Institute of Grenoble.

Scientific Advisory Board



The Kavli Institute
for Brain and Mind
at UCSD



Massachusetts
Institute of
Technology



Dr. Nicholas Spitzer Neuroscientist

- * Distinguished Professor at University of California, San Diego
- * Ph.D. Harvard University
- * Editor-in-chief of BrainFacts.org
- * Recipient of a Sloan Fellowship, a Javits Neuroscience Investigator Award & a Guggenheim Fellowship
- * Director of the Kavli Institute for Brain and Mind

Dr. Jeffrey Krichmar Cognitive Scientist

- * Professor at University of California, Irvine
- * Ph.D. George Mason University
- * research interests include neuro-robotics, embodied cognition, neural architecture
- * Previously Senior Fellow in Theoretical Neurobiology at The Neurosciences Institute.

Dr. Gert Cauwenberghs Bio-Engineering Scientist

- * Professor at University of California, San Diego
- * Ph.D. California Institute of Technology, Pasadena
- * Research interests include Biomedical integrated circuits and systems, micropower analog VLSI, neuromorphic engineering, adaptive neural computation, learning and intelligent systems.

Investment Highlights

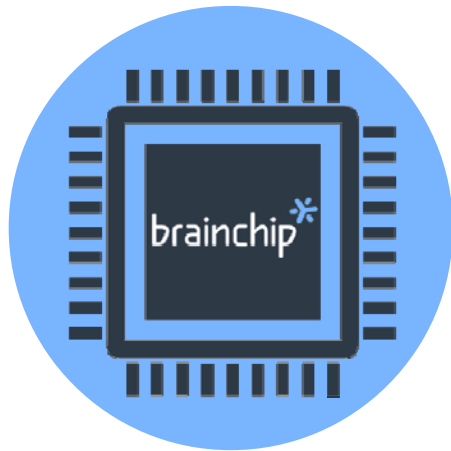


- * **Huge market** – neuromorphic chip market alone to be \$4.8bn* by 2022 and contains 1,000's of potential customers
- * **First mover advantage** – Next generation technology that learns autonomously, is significantly faster and requires considerably less power than what is currently available
- * **Hardware only solution** means thousands of times faster than software, no programming, instant ready neural network with low power usage
- * IP and trade secrets create **high barriers to entry**
- * Experienced innovators with a **disruptive technology** and a **diverse revenue model**
- * On target to meet milestone 4 of **revenue producing license deal** in 2016
- * **Commercially available** today

* Source: Markets and Markets 2015 Report

Company

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