Sustainability means "Continuous Improvement": Change is the Only Universal Constant

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Preface

- It occurs to me a lot of people including policy makers have a static view about sustainability.
- Sustainability should be viewed dynamically and from at least 3 levels:
  - Policy (for Law-makers),
  - Ecosystem (for a society), and
  - Innovation: Individual/Corporate (grass root)
- We are all together in a spaceship called Earth; its life-supporting system is deteriorating.

Philosophical Background of Sustainability

The True Meaning of Sustainability

- The Universal Cycle (Buddhism)
  - (1) Accomplishing (成)
  - (2) Dwelling (住) – or Status Quo
  - (3) Corrupting (败) – or Deteriorating
  - (4) Emptying (空) - or Dying (死)
- The Chinese Holiest Book
  - "The Book of Change" - "I Ching" (易经)
- Sustainability means:
  - Cycles of Change: the Learning Curve/Pattern
  - One must stay away from (3) Corruption because it will inevitably lead to (4) Death

Sustainability means Change (Improvement)

- The Core Messages are:
  - Change is “the Only Constant of the Universal”
  - To avoid “Corruption”, one must Change
    - Everything must be expired – Lifecycle must end (for a new one)!
    - Perpetual “Special Interests” will lead to Corruptions!
  - When we Dwell too long, inevitably we Corrupt
    - Forms of Corruption: complacency, status quo, protectionism...
    - “**Only the Paranoid** (for Change) **Survive**” by Andrew Grove
  - One must stay on the Learning Curves of Change:
    - In-between the stages of (1) Accomplishing and (2) Dwelling on a different curve of a family of curves
      - Short Dwelling means Consolidating. But then, Moving-on to improve
      - As we improve (change for better), we are on a new Learning Curve
    - One may change the Game – Game-changer!
      - “IC -> IT -> IP” Evolution enabling KB Economy is game-changing

Pillars for Knowledge-based Economy (KBE)

	IC	IT	IP
	Hardware	Network	Know-how/Content
Functionality	Physical devices	Connectivity	Experience sharing
Scalability	Moore's Law	Metcalfe's Law	TBD!?
Scaling Factor	2X/18 mon.	Value ~ n^2	Value ~ X^R (X, R >1)
Disruptive Driver	CMOS (IDT)	IPv4/6, Internet, QoS (NMI)	Apple iTunes -> "Unified IP Pooling"
Driving Product/Service	Memories & CPU => SOC	QoS, Mobile Multimedia	Standardization for scaling
Start Time	~1985	~2000	~2015?
Mkt. Size (20 yr)	~$300B	Trillions	Zillions?

- Evolution of Knowledge-based Economy (KBE): IC -> IT -> IP
- Value of IP is based on its "Reusability" and "Ability to Share":
  - The more it is reused, the higher its value is
  - No physical limitation: IP can be used by many users at the same time
- The impact of "free-market IP sharing" on KBE is immeasurable

The Impacts of Game-changers (IC, IT & IP)

The Pillars of Information Age established by Game-changers for Benefits to mankind (that are far-reaching and immeasurable):

- CMOS (led by IDT) became the Mainstream IC technology solving the Moore's Law scalability challenges (as the only way for power reduction) and starting the Microelectronics Age and then the Information Age
- Digital processors (led by Intel, Motorola & TI) replaced Analog ones as the major means for IC designs solving all application challenges
- Foundry business model (led by TSMC) broke the restrictions enabling top IC designers (without their own fabs) to productize their ideas and be their own bosses (making IC/SOC applications covering all walks of life)
- Internet (led by Netscape, Yahoo & Cisco) replaced Telecommunication Network as the Backbone for global communications and Information Age
- Knowledge-based processors (led by NetLogic Microsystems) replacing (software) hashing algorithm providing the only deterministic routing decision solution to handle multimedia traffic latency challenges satisfactorily to realize interactive on-demand QoS
- e-Platform for on-line sale of books (led by Amazon) or Music with copyrights protection (led by Apple) on iTunes

It has been much easier to initiate Game-changing in Productive Force (technologies) than Production Relationship (business models) in human history, because new Productive Force triggers the re-organization or new formation in Production Relationship

The Learning Curve/Pattern: "How to Learn Time-effectively" is the Competitive Advantage of Knowledge-based Economy (the Information Age)

Our Learning Curve/Pattern

- School setting (Pay to Learn):
  - 1 -> 6 yrs.: Child
    - Open-minded, Curiosity-driven…
    - Character forming (Instinctive), EQ, IQ
  - 6 -> 12yrs.: Kid
    - Judgment forming (Cognitive): Morality, Equality, Fairness,…
    - Role models: Parent, Teacher, Relative, Peer, Friend,…
  - 12 -> 18 yrs.: Teenager
    - Individualism forming: Challenging authorities, Identity-asserting
  - 18 -> 22/24 yrs.: University/undergraduate
    - Social skill (Balance) forming: College lifestyle (Transitional)

---------- Huge Gap (for Corporate to absorb) ----------

- Corporate setting (Paid to Create Values):
  - Individual Contributor: Contributing as an Individual
  - Team-builder/Deal-maker: Managerial
  - Path-finder / Ecosystem-builder: Executive

IP Learning Curve in My IC/IT Ind. Career

- AMD (1979-1983) lost to Intel for lack of IP strategy
  - No comprehensive IP portfolio development game-plan
  - Missed-out acquiring DEC/Alpha IP portfolio (vital for clock management)
- IDT (1983-1988, IPO in 1984) failed to stay world-class
  - The "**Disruptor**" introduced **CMOS as the mainstream IC technology**
  - Top management did not believe in IP strategy & it could not be great!
  - Failed to adopt "Continuous Innovation" as corporate culture
- VTI (1988-1989) formed JV with Hitachi
  - A few trips to Japan and understood Japan's "limitations" to innovate
- QSI (1989-1995, IPO in 1996) – as a member of its founding team
  - Adopted from start foundry outsourcing to Japanese partners
  - Licensed technology to Japanese foundry partners for seed funding
  - Missed out partnering with TSMC in 1989 (due to tunnel vision!)
  - IPO was delayed for ~2 yrs. by a frivolous IP infringement lawsuit from a competitor
- PMC-Flash (1996-1998, acquired in 2012) – as its CIPO/VP
  - Adopted IP Licensing business model for its PMOS-Flash technology
  - Failed to seize the window of opportunity to make its tech. mainstream
- NMI (1998-2002, IPO in 2004) – as its CIPO/VP
  - Made NSE & KBP as the "**Disruptor**" revolutionizing IT infrastructure (**QoS**)
  - IP strategy and execution game-plan **from start for IP domination**

Invention/Innovation vs. Game-changing

Types of Invention/Innovation: Its percentage

1)Fool-hearted: >50%

- Purely subjective with little differentiating market value

2)Incremental improvement: >30%

- Some market value but none significant

3)Transitional: <15%

- New applications addressing emerging market needs
- The supporting ecosystem exists

4)Pivotal: <0.1%

- Game-changing ideas that can become mainstream
- The supporting ecosystem may not exist & have to be developed

5)Foundational - Pivotal and Forever Lasting: <0.01%

- Fundamental ideas independent of Technology Lifecycle
- E.g.: hardware implementation of programmable "Don't Care" state by means of "Ternary Cell" - the "DNA Building Block" of Pattern Recognition Engine

Recent Chinese History about Game-changing

- Chinese Communist Party from its founding to becoming the leading party in 1949 was a good Example of effective Game-changing:
  - Jinggangshan (井岗山): The first foothold or beachhead (to experiment game-changing)
  - Army Discipline & Mass-centric Roadmap: Alliance and coalition building
  - Long March (长征): Fighting uphill battles, Self-preservation, Perseverance against all odds and Endurance against hardship, Trial-by-fire, Earning the trust and respect from grass-root rank-and-file, Path-finding (Turning Crisis into Opportunity)...
  - Yanan (延安): Safe Heaven, Staging Ground, Leadership Training Camp…
  - War against Japanese Invasion (抗日战争): Deal-making to redefine National core interests and values, Opportunities to occupy high moral grounds, National Ecosystem-building for the overturn of KMT…
  - Land Reform (土地改革): Consolidation of broad base alliance to secure the hinterland and logistics supports to win the war against KMT
- Chinese Communist Party as the Game-changer could win against KMT (as the collection of entrenched stakeholders refusing to go along) because:
  - It was a better learning organization (learning from mistakes before they became fatal),
  - It had much higher ecosystem integrity against erosions/corruptions (stickiness) - much less internal friction,
  - It gained better supports from Chinese masses (for then sustainability and consolidation).

The Ecosystem & Challenges for Sustainable Development (S. D.): A Global Perspective

Core Value for Sustainability

- Universal Soul-searching Questions (for any culture & religion)
  - How human being should survive in this universe as a species?
    - Pursue a path of self-destruction entangled in webs of petty disputes (self-inflicted injuries of thousand cuts)?!
    - Pursue a path of self-enrichment and play much larger roles among the Stars
  - How each individual makes his/her present lifetime on Earth meaningful and worthwhile?
    - To be controlled by circumstances/situations
      - To survive in misery/despair (poverty) or self-indulgence/lust
      - Trapped in one's comfort zone in midst of fear and ignorance
    - Take control and change circumstances/situation
      - Stride to create lasting values for advancement of humankind
- The Core ("精粹") of Greater Chinese Culture – "天地人大合一"
  - 人法地, 地法天, 天法道, 道法自然 (道德经)
  - 天("Space-Time")行健("Continuum"): 君子以自强不息 (易经)
  - 地("Ecosystem")势坤("Harmony"): 君子以厚德载物 (易经)

Challenges for Sustainability

- Technologies becoming means of self-destruction
  - We have been creating mostly temporary fixes and push the compounded problems downstream and to our future generations
    - Environment degradations are commonplace: no clean water & air
  - Innovation is supposed to create lasting values
    - Instead, becoming vehicles of self-serving self-enrichments
- Knowledge becoming the leverage for greed and self-indulgence of the entrenched stakeholders
  - The gap between the "have" and the "have-not" is widening
  - The Middle-class is shrinking and shouldering big tax burdens
  - The SME are deprived of fair market & resource accesses
  - Competitions are no longer by Merits but "Special Interests"

Framework for Sustainable Development (S. D.)

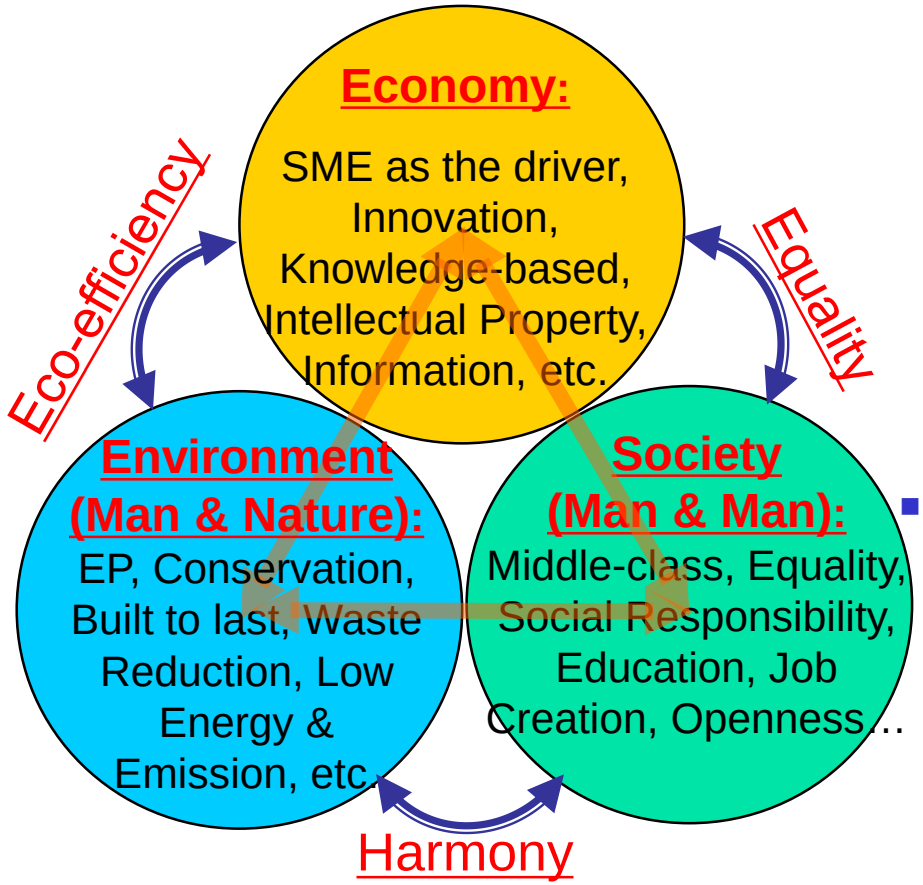
National Policy:
Sustainable Development
Knowledge-based Economy,
Low Energy, Low Carbon…

Social Development:
Economic Transformation ->
Knowledge-based Economy:
Intellectual Capital as Core

Enterprise Uplifting:
"Going Global" - Globalization
World-class Competitiveness,
IP Powerhouse

- Trinity – Synergetic interdependence among these 3 vital issues in Developing Countries (DC)
- Sustainable Development & Economic Transformation are the Direction for Enterprise Uplifting
- Whether an enterprise can be world-class depends on overall environment and individual effort

Framework for S. D. – Policy Level



- The Key Factors for sustainable development:
  - **Environment**: the totality of external conditions and forces, and life-line to support "Society"
  - **Society**: the totality of internal conditions and forces
  - **Economy (developments)**: the totality of activities to enrich "Society" that can cause instabilities or collapse in the triangular relationship
- The goal is strengthen the triangular relationship through harmonization while pursuing socio-economic developments
  - Make it **Win-Win-Win**!
  - It has been proven in history that the consequence of unsustainable developments is the collapse and self-destruction of the society - due to ignorance and greed!

Sustainability in the Socio-economic Setting: How should we move the Society ahead w/ Sustainable Growth & Decent Job Creations?

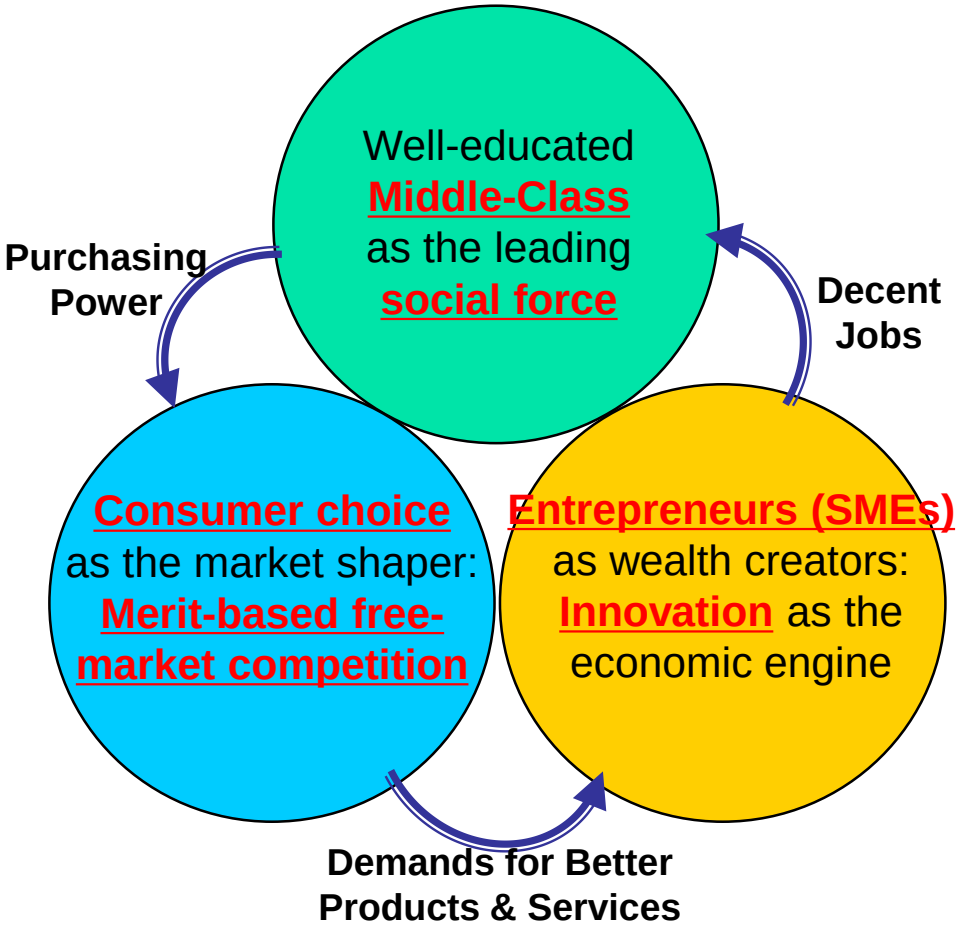
Optimal Conditions for Innovation (Society)

IC industry has been the only good example of continuing innovation in human history – perpetual product/technology advancements according to Moore's Law scalability (cost reduction by 50% in every 18 months):

- Open competition – **monopoly is in check**
  - Even Intel has to be on its toes ("Only the Paranoid Survive")
  - Any start-up can be the next Intel
- Global collaborative innovations – according to ITRS
  - For coherent collaborative ecosystem building and technology node migration
  - **Collaboration and competition co-exist side-by-side**
- Direct customer-value driven
  - Striding to solve customers' mission-and-time-critical applications
  - **Profit margins reflect values to customers**
- Rapid progress completing the industry-wide learning cycle
  - Close coupling and coordination between the demand-chain (services & applications) and the supply-chain (designs & manufacturing)

Ecosystem for S. D. – Engine for Inno-nation

Economic driving forces for an advanced knowledge-based society based on "Silicon Valley" experiences



The Trinity of Knowledge-based Society: Middle-Class, SME (Entrepreneurship) & Consumer rights/power coexist in unison creating a self-prospering economic growth engine for an advanced knowledge-based society

Prosperity/Innovation-generating Cycle

- **Competitive SMEs** (entrepreneurs) provide decent jobs (in large quantity) to sustain a **well-educated Middle-Class**.
- **The Middle-Class** in turn with their purchasing power shape the market by their preferred choices **"picking winners by merits"** - that is the essence of "**free market economy**".
- **Consumer power and choices** in turn drive SMEs to develop **better products and services** - that is the core of "**Continuous Innovation**".
- **SMEs** with better products and services as market leaders in turn create more well-paid value-adding jobs to grow the **Middle-Class**.

Ecosystem-building for Inno-nation

- Government policies and efforts providing a nurturing ecosystem to create and sustain the "Prosperity-generating Cycle" - as observed in Finland & others
  - Serve the long-term interests and well-being of the Middle-class (education, professional development, health care, housing…)
  - Develop the Middle-class to be a well-educated, civic-minded, value-creating socio-economic force with global vision
  - **Strong consumer rights and protection measures**
  - Uplift **global competitiveness** of **indigenous SMEs**
  - **Provide an open, fair, free-market, supportive environment to groom indigenous SMEs to be world-class innovators**
  - **Incentivize innovations of domestic SMEs and provide open pilot-test platforms for new applications and services**
  - Upgrade continually the **education system** to serve the above goals for the Middle-class and domestic SMEs

Learning from Silicon Valley

- Middle-class as the movers-and-shapers in a highly-developed Knowledge-Based (KB) society
  - **Entrepreneurship (Startups/SMEs) & Innovations**
    - SMEs are leading the future in a well-developed KB society
      - Well-funded by the international venture capital community
      - Competing favorably against super corporations
    - New technologies and business models are commonplace
    - Risk-taking is regarded as a valued character trait
      - Failure means giving up trying
  - Free-market competition based on merits (freest mkt. for SMEs)
    - Antitrust, anti-monopoly & anti-corruption are the norm
    - Sophisticated consumers & stakeholders pick market leaders
  - (All-welcome) International talent pool and melting pot
    - Well-educated immigrants are major contributors
  - Corporations as responsible global citizens (non-zero-sum-game)
    - Meeting high standards of self-governance worldwide
    - Establishing a pro-environment (all-win) global ecosystem

Key: Education System & Civic Duty Mindset

- The education system in a developing country must prepare its people to be **productive citizens** (with national identity & pride).
  - Civics must be formally taught to ensure **democracy with civility**
  - Ability to engage productive discussions for **root-cause analyses, truth discovery and path-finding**:
    - Based on **reason, logic, civility, debate and dissent – all proper behaviors in a corporate setting (at least in Silicon Valley!)**
- The education system in BRICS needs to prepare their next generations to fulfill their historical role to safeguard peace and prosperity for the 21st century. E.g.,
  - China's transformation into a "true middle-class society"
  - Steady growth in harmony with proper civic awareness & global responsibilities
  - Hong Kong can be such a pilot development platform for the transformation of China

Middle Class as the Core for S.D.

- Healthy and confident
  - Flourishing and not eroding, nor deteriorating
- Well-educated and **well-mannered (civic-minded)**
  - Competent, confident & **polished**; high I.Q. & **E.Q.**
  - **As the well-educated professional talent-pool for SME**
- Productivity & Service oriented
  - Capable of productive work: **collaborative root-cause analyses, truth discovery, path-finding and ecosystem-building**
  - **Creating values** in **high-end (professional) service** sectors
- Well-informed and **well-deserving**
  - Able to sort out complicated and tough issues
  - **Holding** government and elected officials **fully accountable serving "Middle Class" economic and social (non-ideological) interests as top priority**
- **Self-prospering**
  - Prospering as a unified group **controlling its destiny**

Entrepreneurs are the Seeds of Inno-nation

- In a well-developed knowledge-based society (Silicon Valley), SMEs (entrepreneurs) as a group is the foundation for the Middle Class.
- SMEs (entrepreneurs) are vital as the **renewing agent of a society**:
  - Decent high-value **job creation to sustain a healthy Middle Class**
  - **Continuous innovations** creating wealth to the society growing from start-ups to world-class corporations (e.g., Google, Microsoft, Cisco…)
  - Reshaping the market economy for better optimization of resource utilization and conservation
    - Channeling the resources to create new values, technologies and business models - e.g., clean tech, social networks, business process re-engineering…
    - Leading the effort to improve community's social infrastructure and fabrics - education, transportation, environment, etc. (like Microsoft, Cisco…)
    - **Creating grass-root opportunities for social uplifting against poverty**
- BRICS need to improve its **SMEs' capabilities and maturity** to be a long-term economic power - lasting prosperity!
  - Nurturing its SMEs should be the **TOP PRIORITY** to achieve both "**Harmonious Middle-class Society**" and "**Indigenous Innovation**".
  - It should channel a portion of their huge Foreign Exchange Reserves as venture and seed funding for its SMEs - **investing intelligently for its own destiny and bright future!**

Stage of SME Development: China vs. US

Stage of development	Key asset / value driver	Domain knowledge	Human resource development	Primary capital sources	Scalability factor
Agriculture	Farmland	Family-recipe	Hands-on training	Family	Copy
Factory-cluster era	Low-cost labor	Task oriented	Hands-on training	Family & friends	Counterfeit & clone
Industrial era	Automated mass-prod. technology	Techno-logical oriented	Profit-driven training	Traditional investors, govt. prog.	Standards, trade assoc.
Post-industrial era	Business services/ know-how	(Business) Process oriented	On-job professional development	VC, Institution investors	Standards, IP & license
Knowledge based economy	Business intelligence	"Integrated system"	"Learning ecosystem"	"Open source platform"	"Knowledge sharing"

On average, US SMEs are at "Post-industrial" stage of development, whereas China (as an example for BRICS) SMEs are at "Factory-cluster" stage of development.

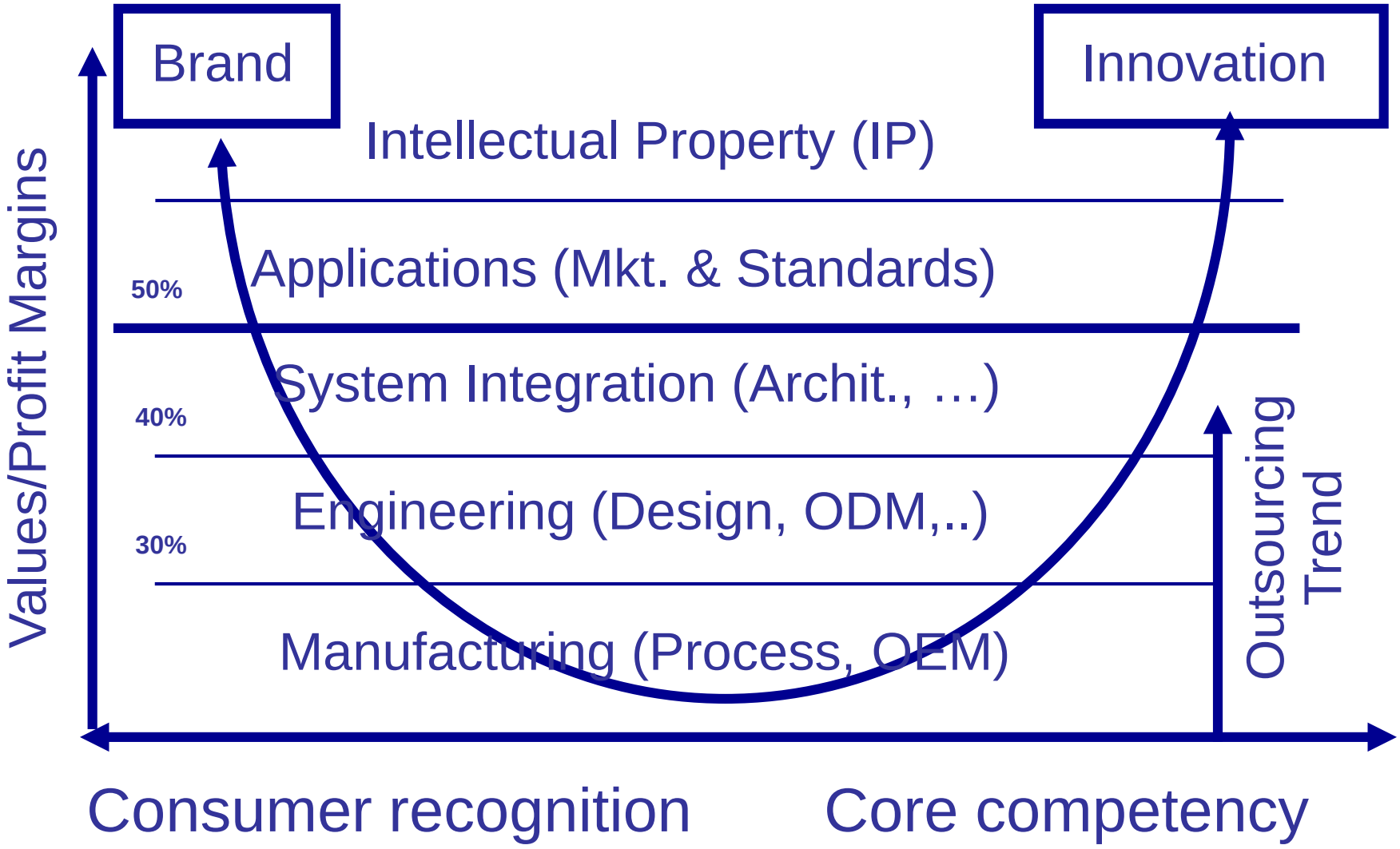
Common Problems of SME Immaturity

- SME immaturity Issues in China as a reference for developing countries:
- Lack of professionalism, quality of service and pride in one's work
  - Lack of dedication, credibility and accountability; conflicts of interest
  - Shaky accounting practices; lack of transparency and proper check-and-balance;
- Lack of innovation capabilities and proper methodology for sustainable developments
  - Lack of vision and roadmaps for product and technology developments
  - Counterfeit and Intellectual property infringement & theft are commonplace, damaging consumer trust & confidence
  - Little effort on human/intellectual capital development
- Zero-sum-game mentality - immaturity
  - Predatory competition over win-win ecosystem approach
  - Lack of understanding about their core values to the society
  - Ownership overrides management: impeding corporate management/culture development
- Ignorance about harms to the society (lack social responsibility)
  - Environmental damages: Air and water pollutions; lack proper waste treatments & material recycling
  - Energy inefficiency & wastes
  - Lack of social responsibilities and global citizenship
- Lack of capital & funding

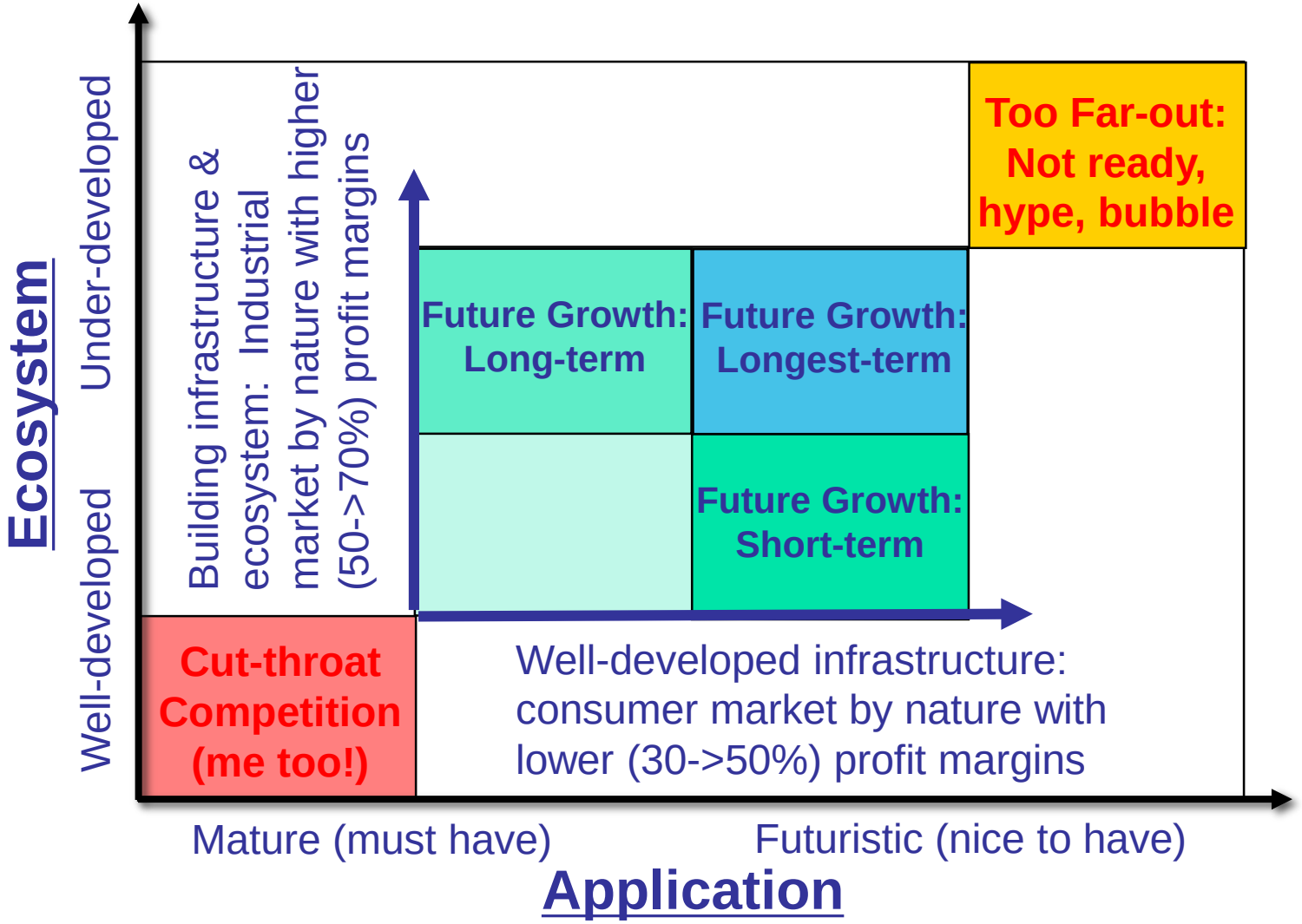
A SME's Dream: Global Innovation Leader & Becoming an IP Powerhouse

The Value Hierarchy (Business Models)

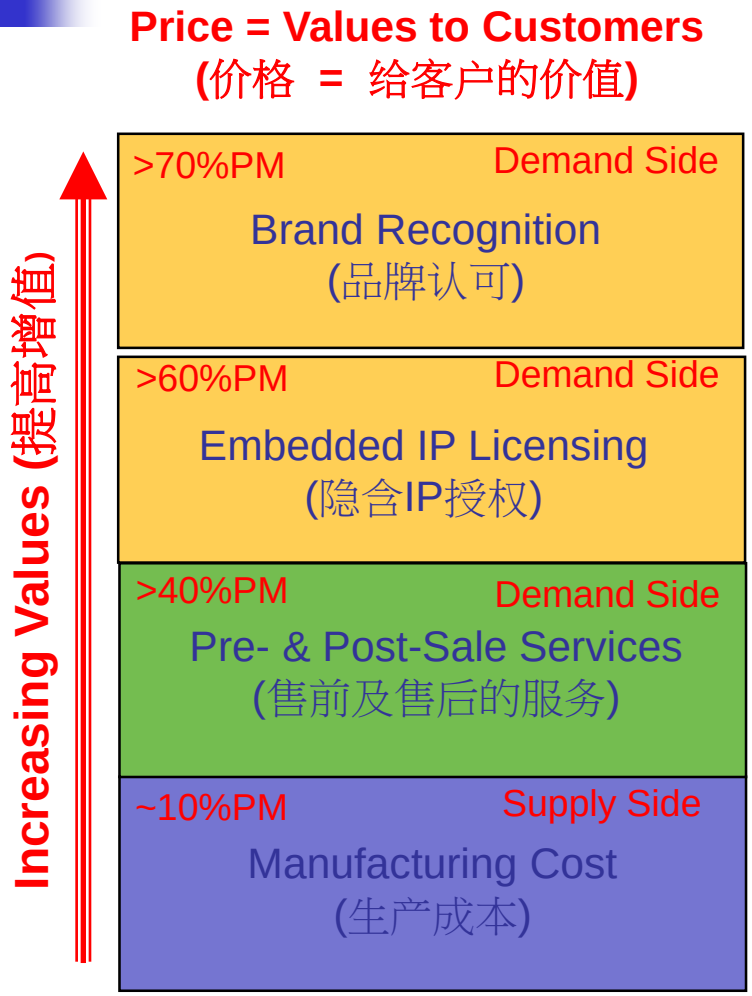
Presented at Intellectual Property Symposium 2002 in Guangzhou on December 10, 2002



Market Positioning - Product Focus



Raising Values of a Product (IP is the Core)



- **Price = Value to Customers =>**
  Price = Mftg. Costs + Services + Embedded IP License + Brand
- **Pre-sale services** mean design-win efforts providing solutions to address customers' problems
  - This is the **best sources of innovation** and ideas for the next-generation products
- **Post-sale services** mean reducing customers' costs of ownership, extending the useful lifetime of the product, generating recurring sales
- **Embedded IP licensing** means the customers can use the product IP for their own product uplifting & differentiations - e.g., "Intel Inside"
- **Brand recognition** means the customers recognize the product and its maker for superb quality, performance, reliability & services

Profitability vs. IP Creation (Competitiveness)

Price = Values to Customers
(价格 = 给客户的价值)

Increasing Values (提高增值)

>70%PM Demand Side Brand Recognition (品牌认可)	OPEN	Trademarks
>60%PM Demand Side Embedded IP Licensing (隐含IP授权)	OPEN	Utility Patents, Design Patents, Copyrights…
>40%PM Demand Side Pre- & Post-Sale Services (售前及售后的服务)	PRIVATE	Trade Secrets (Know-how)
~10%PM Supply Side Manufacturing Cost (生产成本)		

Only <20% Know-how for Patents, the rest kept as Trade Secret

Methodology for "CRE + Continuing Innovation"

Lead Customers' Requirements => 2nd G => 3rd G =>…

Close collaboration between the customer (CRE) and the vendor
Mission-&-Time Critical Requirements along **Demand-chain**

Differentiating Value Creations => 2nd G => 3rd G =>…

Business Model => 2nd G => 3rd G =>…

Service/Product Roadmap => 2nd G => 3rd G =>…

Application/Technology Roadmap => 2nd G => 3rd G =>…

IP Portfolio Development => 2nd G => 3rd G =>…

The next innovation ideas come from customers (**CRE**) & "**Stress Tests**" identifying
(1)The weak-links in product design & performance and scalability
(2)System (architecture) integrity and scalability (elasticity) issues
(3)The bottlenecks for scalability (technology and manufacturability roadmap)
NetLogic Microsystems is a good benchmark for SMEs as innovators

Lifetime Achievement as its "Founding CIPO":

NetLogic Microsystems – Driven by Innovation

- **Ranked by IEEE Spectrum magazine among Top 10 companies with the Most Powerful Patent Portfolios in the Semiconductor Manufacturing category, Dec 2006**
  AK comment: **Based on a portfolio of ONLY ~100 (high-quality) patents**
- **NetLogic Microsystems ranked:**
  - **FIRST** in "Pipeline Originality" **(Killer Patents!!!)**
  - **SECOND** in "Pipeline Impact" **(Game Changers!!!)**
  - **TENTH** in overall "Pipeline Power"

IEEE

- **Others in the Top 10 included Broadcom, Intel, Micron, Sandisk, Texas Instruments and Xilinx (All multi-billion$ companies)**

AK comment: Considering the facts that NM is much less than 1/10 of the size (in revenue) of the other 9 top-ranking companies and much younger (<10 years old), it is a crowning achievement! Likewise, "ipIQ" rated NM's portfolio the best for a medium size (~$100M) high-tech company worldwide in its "Patent Scorecard 2006" report with the 2nd highest CII (current impact index).

Mkt. Cap.: US$250M @ 2004 IPO => US$3.7B @ 2011 M&A (14.8X in 7 years = >46% CAGR)

Productivity Jumps by Scalability

- Present IT-based productivity accelerators
  - Hardware - Moore's Law (US is leading in SOC)
  - Network - Metcalfe's Law (China's advantage)
- Emerging IT-based productivity accelerators
  - Service/application - SaaS (HK's leverage)
    - Driving network computing, cloud computing…
  - Content/data - International data exchange (HK's leverage)
    - Information/data sharing - RFID-tracking (real-time) & 物联网
    - Data-mining - Business Intelligence (highly valuable!)
- Other productivity accelerators
  - **Standardizations and related IP generations**
  - **IP reuse, IP sharing through trading and pooling**
- Comments:
  - IP rights protection is essential to enable scalability
  - China should have an advantage in global competitiveness from economy of scale (from larger population sizes) if aligning well

The Means for Sustainability (on the Technological Level): the “Green” Way to Innovate

Enablers for S.D. – Technological Level

- Key criteria to lead the future for lasting prosperity
  - Energy: Conservation & Effectiveness; Renewable; Dist. Smart Grid
  - Emission: Reduction and Elimination
    - End-to-end reduction & elimination
    - Close-loop recycling – zero discharge into the environment
  - Water: No Contamination and Smart Use
    - Minimize **end-to-end supply-chain & lifecycle** water footprint
    - Close-loop recycling – zero discharge into the environment
  - Continuous **collaborative innovation**:
    - **Perpetual collaborative learning cycles and self-improvement**
    - **Knowledge sharing, tech transfers and business intelligence**
- Innovation focus – **TRUE CLEANTECH!!!**
  - Minimize end-to-end lifecycle footprint of energy, emission & water, & no harmful by-products simultaneously thru' collaborative innovations
  - BRICS need a lot of clean-tech transfers for its sustainable developments – great opportunities!

Understand the Core Differentiation

- How fundamental is the idea? More the better!
  - **Independent of technology**? "Must-have" for intelligent?
- What position is it in the value-chain? Higher the better!
  - On top at the global system architecture level? Or H/W level?
- What values can it bring to the customer?
  - **Mission-and-time critical?** Improve its profit margins?
- How disruptive can it be? Exponential growth potential!
  - Whole new paradigm shift? Last forever?
- Can another technology/idea be its disruptor?
  - How basic is the invention? On "NDA" level?
- Its usefulness over time - invariant? Its lifecycle?
  - What is the required supporting ecosystem for its usefulness?
- What are the alternative/competing solutions?
  - What is its market share? Differentiations?
- How large the TAM can it serve now and future?
  - Demand driven by Moore's Law and Metcalfe's Law?

A Fundamental & Useful Innovation!

- The basic DNA of intelligence is the ternary ("1" or "0" or "X") CAM cell with the implementation of "don't care" state in circuit by means of the Mask bit

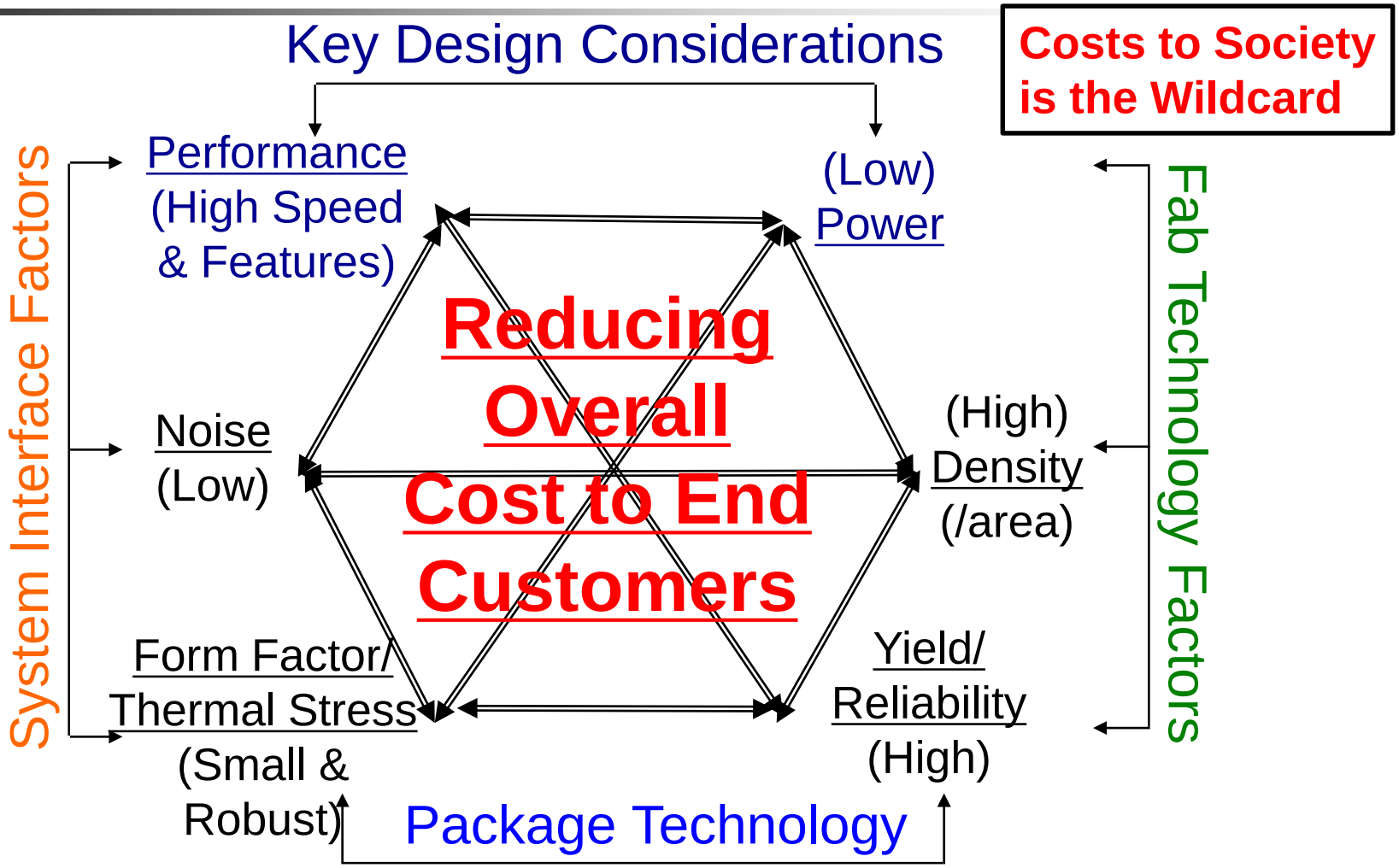
	Match bit	
	Mask bit = 0	Mask bit = 1
Input bit ≠ Ref. bit	0	1
Input bit = Ref. bit	1	1

  - 2 memory cells, a comparator circuit to determine "Match" (i.e., basic intelligence) & a Mask bit to give a dimension of freedom (i.e., option)
  - Degree of intelligence <=> degree of possible options
- The ternary CAM (content addressable memory) becomes the basic building block for parallel-processing engines/filters.
- KBP (knowledge-based processor) is essentially a massy array of ternary CAM with some classification and prioritization circuits.
- SRAM that was avoided by IC manufacturers like plague has reborn into its second life as high-value ternary CAM -- What an innovation! Discovering treasure in a junk yard!

Innovation Methodology - Valuable Ideas

- Customer value driven corporate culture:
  - Innovation is pursued solely to create DIFFERENTIATING VALUES to the customers
    - Solving customers' mission-and-time critical problems
    - Contributing directly to their bottom-line in term of critical functionality, cost, performance, low-power, quality and delivery
  - Strategic partnership and close working relationship with the lead customer is a must
    - All valuable innovation ideas come from lead (strategic) customers
    - Cisco for NetLogic Microsystems (recently ranked as the best supplier by Cisco)
  - Aligning all the company's activities to be proactively responsive to the customers' current and future needs
    - Including technology and product roadmaps as well as employee evaluation/promotion
    - Continuous innovations by solving the customers' next biggest problems (the next product development cycle)

Customer Demand-side Driven Innovations



"Design-in Methodology" for "Doing the Right Things Right at the First Time" mindset (to proactively solve problems at their sources of creation) to enable "First-Silicon" Success: Marketability, Scalability, Robustness, Manufacturability, Reusability, Quality/Reliability, Testability, etc. – All for "Integrated Design Capability"

Innovation Methodology – Process/System

- Proper standardized process for innovation:
  - Goal: to create differentiating values to the customer
  - Scope: to be consistent with the corporate capability and core competence expansion roadmap
  - Alignment: to company interests and strategic development
  - Method and procedure:
    - Discovery, peer review, first draft of the invention, background check including competitive benchmarking, patent committee review, further refinement and due diligence checks, patent prosecution, etc.
  - Division of labor between the patent attorney and the inventor:
    - The in-house or hired patent attorney is responsible for drafting the patent application including claims (which are legal statements and must be handled by the patent attorney instead of engineer)
    - The inventor (inventing engineer) is responsible for full (written and oral) disclosure of the invention to the patent attorney

Innovation Methodology – Team (People)

Team building/teamwork:

- Train engineers to acquire critical-thinking and truth-discovery skills, to collaborate with one another
  - Constructive interaction instead of internal friction
  - Challenge conventional wisdom and assumptions (with "What If" and "Why Not") thinking "beyond the box"
  - Open to new ideas but mindful of the weak links
  - Pro-action (progress driven) - speedy learning through practices and actions
- Build team with talents of complementary technical domain knowledge, including specialists and generalists
  - Understanding higher system-level optimization and trade-offs is essential
- It must be a COLLABORATION EFFORT (to be more valuable) instead of individual one
  - Useful solutions and creations are mostly from multi-disciplinary approaches
  - Collaboration provides the necessary sanity check against "missing the big picture" and ensuring the money and resources are well spent
    - Innovation costs a lot of money and misled innovation can be an opportunity loss or a major disaster to the company.
    - Too many high-tech companies went into disaster because of premature innovations (due to lack of supporting ecosystem/infrastructure):
      - VMOS was a good example that sank AMI in the early 1980s.

Innovation Methodology - Sustainability

- Ecosystem for sustainable efforts:
  - Top management participation & full-commitments:
    - Executive patent committee consisting of CTO, VP of Business Development or CMO, VP of Operations or COO and Chief IP Officer or in-house leading patent attorney
  - Incentives to inventors (positive reinforcement):
    - Stock or monetary incentives
    - Career advancement considerations
    - Relieving the inventor the burden of drafting the patent application
  - Corporate culture conducive to continuous innovation:
    - Driven by value creations to the customer
    - Reinforcing team building, teamwork and information sharing
    - Cross learning among the project team members with different functional/domain expertise (e.g., design, device/process, product, test, packaging, applications),,,

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Thank You!
多谢光临指导!

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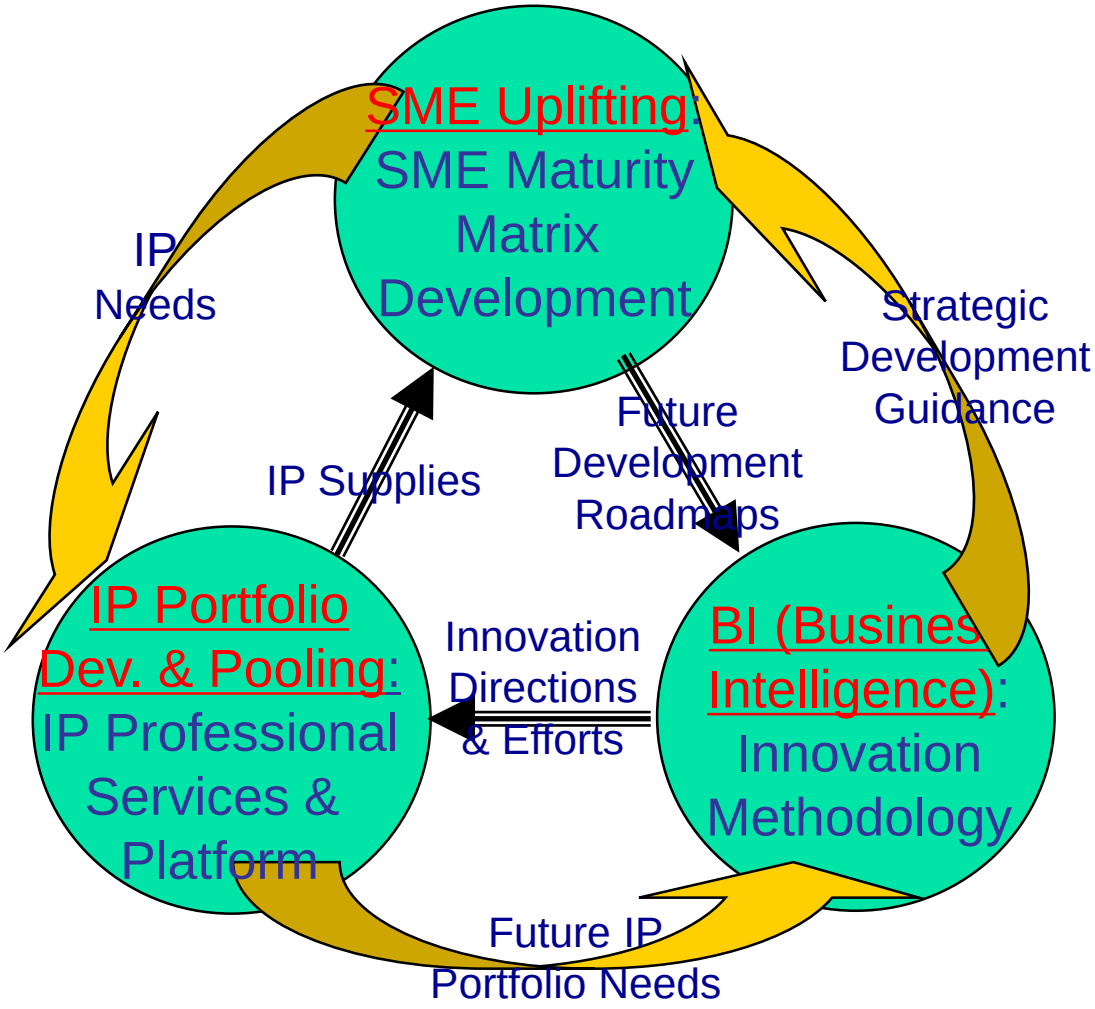
Industrial Uplifting – SME is the Focus!



Comprehensive SME Uplifting through Proper BI and IP Prof. Services

The Roadmap for Global Competitiveness

- (1) Sustainability
  - Get out of the slippery slope syndrome and gain a solid foothold or plateau - no longer fire-fighting all the time
  - Systems and procedures replace ad hoc individual processes
- (2) Profitability
  - Make enough money to be self-funding with positive cash flow
  - Able to sustain reasonable yield and quality, eliminate wastes (control costs) and improve productivity
- (3) Competitive Differentiation
  - Recognized by customers as an **established brand** with its own niche and advantage(s)
  - Able to enhance core competency for strategic positioning
- (4) Continuous Innovation
  - Becoming a learning organization with a self-renewable corporate culture promoting knowledge sharing and recovery

SME Uplifting & Needed Services (I)

- OEM (Stage 1st to 4th) Uplifting to ODM/OBM (Stage 4th to 8th) Methodology based on Silicon Valley Best Practices and King-making Success Cases (like "NETL", Intel…)
  - Without systematic corporate development for uplifting, China existing OEM growth model is NOT long-term sustainable and fails to meet the "**Scientific Concept of Development**"

- Stage 1st (sustainability): ISO 9000 compliant or certified
  - Ability to sustain the business with some basic management system

  Needed Services: Consultation on Processes for Continuous Improvements & Innovation
- Stage 2nd (profitability): Systematic Capital Development & proper capital/resource utilization
  - Ability to handle money accountably and effectively
  - Proper cash flow management to gauge degree of risk-taking
  - Strengthen relationship with financial institutions

  Needed Services: Consultation on Process Improvement in Capital Utilization & Cash Flow Management
- Stage 3rd (profitability): Productivity and Yield Improvement
  - Ability to streamline operations, eliminate wastes and improve productivity
  - Ability to control costs (check if cost reduction roadmap is in place)
  - Ability to improve quality (check if quality improvement roadmap is in place)
  - Ability to improve delivery (check if cycle-time reduction roadmap is in place)

  Needed Services: Consultation on Process Improvements on Cost, Quality and Cycle-time
- Stage 4th (profitability & differentiation): Systematic Customer Service Improvement & CRM
  - Ability to serve customers and address their REAL needs
  - Customer Survey, Collective Action Request, Failure Analysis Report, etc. are in place
  - Ability to serve customers' future needs: product/service roadmap in place

  Needed Services: Landscape Analyses, Domain Business Intelligence, Industry Standard Mapping

SME Uplifting & Needed Services (II)

Stage 5th to Stage 8th developments are what China OEM lacks to become ODM/OBM

- Stage 5th (differentiation): Core Competency enhancement & Strategic Market Positioning
  - Systematic benchmarking against competitions and customer expectations
  - Strategic marketing & product family roadmap; Technology roadmap and related capacity planning
  - Ability to leverage and develop one's strength with multi-disciplinary core team
  - Understand strategic partnership and the need to outsource

  Needed Services: Landscape Analyses, Domain BI, Ind. Std. Mapping, IP Specialist/Analyst Training Program
- Stage 6th (differentiation & innovation): Systematic Corporate Culture development
  - Ability to develop a shared vision & mission, & mobilize employees and vendors to achieve the mission
  - Employees as the most important asset; systematically harness employees' suggestions for innovations
  - Some innovation incentive program in place

  Needed Services: ICM (Intel. Cap. Managmt.), Patent/IP Assessment & Valuation, IP Manager Training Program
- Stage 7th (differentiation & innovation): Intellectual Asset & IP Portfolio developm't & management
  - Ability to innovate systematically and collaboratively (collaborative innovation)
  - Patent portfolio development program in place
  - Sophistication on patent claim strategy: claim mapping and positioning
  - Chief IP Officer is in place – as a member or advisor of the Board

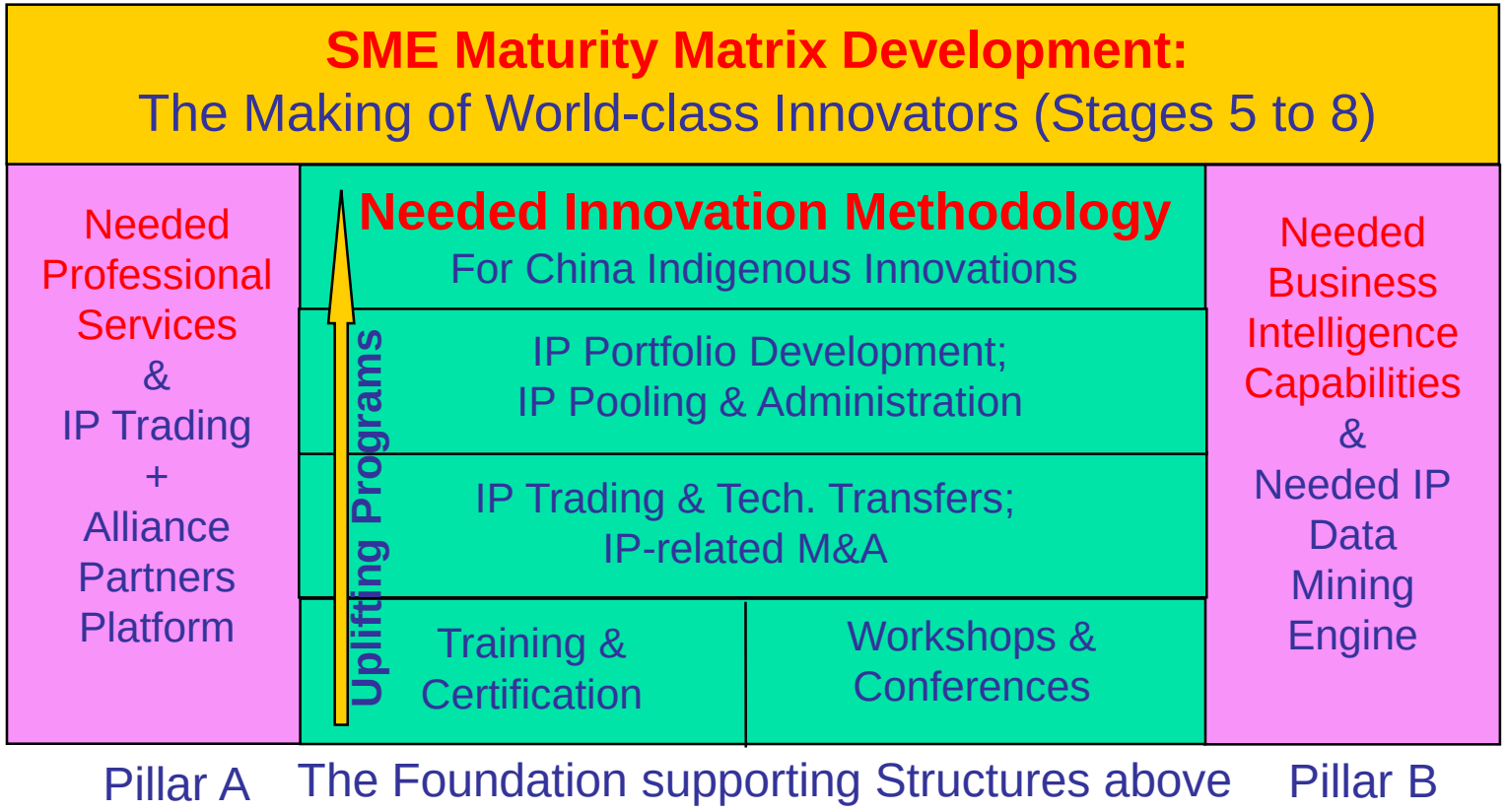
  Needed Services: ICM , IP Portfolio Development, IP pooling, CIPO Training Program
- Stage 8th (continuous Innovation): Becoming a Learning Organization
  - Ability to be a true knowledge-sharing learning organization
  - Chief Knowledge Officer (CKO) is also in place
  - Promoting rank-and-file knowledge acquisition and sharing, and continuous improvements
  - Ability to assimilate acquired business and talents (Growth by M&A)
  - Ability to develop a self-renewing self-learning proactive corporate culture

  Needed Services: Global CIPO/CKO Training Program, M&A Consulting & Coaching

Only Enterprises with Stage 5th or higher capabilities should consider going global

Needed Professional Service Portfolio

The Goal: OEM to ODM/OBM Transformation & SME Uplifting



Comment: Developing Countries need comprehensive capabilities to serve its enterprises' needs to be world-class.

Proper IP Strategy for Industrial Uplifting

- Understand the IP landscape
  - Value-chain covers Supply-chain & Demand-chain
    - From the Supply-chain: design/manufacturing
    - **From the Demand-chain: APPLICATIONS & SERVICES**
- Weakness (as compared to developed countries)
  - 30+ years behind in Supply-chain related IP
- Strength (for a developing country like China)
  - Huge domestic market size for rapid scalability & ROI
  - Ahead in many new application areas (AMR, LED, IOT,…)
- Proper actions:
  - Build IP portfolio in the application/service domain
    - **Promote standardization**
  - License IP in the supply-chain domain
    - Learn from TSMC how to overcome IP deficit honorably - upfront JV (licensing & TT) w/ Philips Electronics NV @ >30% equity

Proper Preparation for Going Global

- Basic Prerequisite
  - Quality Assurance capability: at least ISO 9000
  - Reasonable financial size: >US$50M with >25% PM
  - Overseas experience: at least sell directly or indirectly abroad
  - Service competency: professional service system ready
- Strategy – step by step penetration
  - Brand development – IP liability exposure
  - Customer relationship management – Business model?
  - Degree of localization
- Suitable landing site
  - Cultural issues (adapting to the local custom and value system)
  - Market issues (taking the path of least action/resistance first)
- Professional support ecosystem
  - Legal, accounting, public relations, media relations, government relations, labor relations, community interest groups…

Key IP Strategies for China SME

- Domestic IP pooling
  - Need to pool ~1000 domestic patents for each industrial product sector (e.g., LED, Nano-tech…)
  - Mostly from domestic universities and R&D centers
  - Used the IP pool as bargaining chips
    - Negotiate for favorable license terms (<3%) for Zero-IP entities
    - Negotiate for cross licensing as ultimate outcome!
- (Sunrise) Tech transfers for inbound IP from overseas
  - For technological and engineering uplifting w.r.t. roadmaps
- International M&A for outbound acquisition
  - Identify & establish collaborative advantages: (1) Cost down via tech/production transfer & logistics; (2) Market expansion/scaling
  - Acquire ~15% for a board seat to be represented by a local senior professional executive originally from the developing country
  - If “Dating” goes well, “Marriage” (full acquisition) can follow

Challenges for Going Global

- Cultural Differences (Developed vs. Developing)
  - Respect of individual rights and "personal space"
  - Bottom-up (consensus-building) instead of top-down
  - Team-building instead executive directive
  - Transparency: corp. accounting & governance; social responsibility
- Value Focus Differences
  - Quality first and service is paramount
  - Customer is the king & judge
- Legal System
  - Employee's rights & shareholder's rights
  - IP rights protection
- Social Responsibilities
  - Environment protection
  - Community services and goodwill

Thank You!
多谢光临指导!

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Strategic Means of IP Protection

Barriers against copying in Developing Counties

- Business Model – Service-franchising is the best
  - Contractual framework in favor of the franchisor.
- Business/operation process – proper SCM
  - Close-loop fully-traceable certified process is the best
- Network system integration
  - Real-time monitor and surveillance is the best
- System integration - PaaS
  - Proprietary firmware as trade secret
- Software - SaaS
  - No source code disclosure is the best
- Hardware - ASIC
  - Anti reverse-engineering practice is the best

Proper Company Valuation based on IP

- Covering the whole corporation development lifecycle from start-up to Fortune 500 -- no such IP valuation modeling exists
- Account for successive product development life-cycles for continuous innovation in accordance with maturity of the supporting ecosystem and infrastructure to enable the new applications
  - Apple is the master of this path of continuous innovation
- Account for successive technology development life-cycles in accordance with industrial technology roadmap
  - Intel and TSMC were the most successful companies leading the technology roadmap based on Moore's Law
- Account for successful product/technology patent portfolio building to monopolize the market - "patent" means legalized monopoly for ~18 yrs!
  - E.g., Apple in iPod e-commerce platform
- Account for capabilities to scale up production by proper SCM
- Account for business scalability and resilience to disruptions including those from business process re-optimization like outsourcing
- Must be based on market size and market share and their projections.
- Must be in line with the market capitalization of the market leaders (as benchmarks) and yet able to quantify the up-side potential of any technology-based start-up.

Lifetime Achievement as its "Founding CIPO":

NetLogic Microsystems – Driven by Innovation

NETLOGIC MICROSYSTEMS

- **Ranked by IEEE Spectrum magazine among Top 10 companies with the Most Powerful Patent Portfolios in the Semiconductor Manufacturing category, Dec 2006**
  AK comment: **Based on a portfolio of ONLY ~100 (high-quality) patents**
- **NetLogic Microsystems ranked:**
  - **FIRST** in "Pipeline Originality" **(Killer Patents!!!)**
  - **SECOND** in "Pipeline Impact" **(Game Changers!!!)**
  - **TENTH** in overall "Pipeline Power"

IEEE

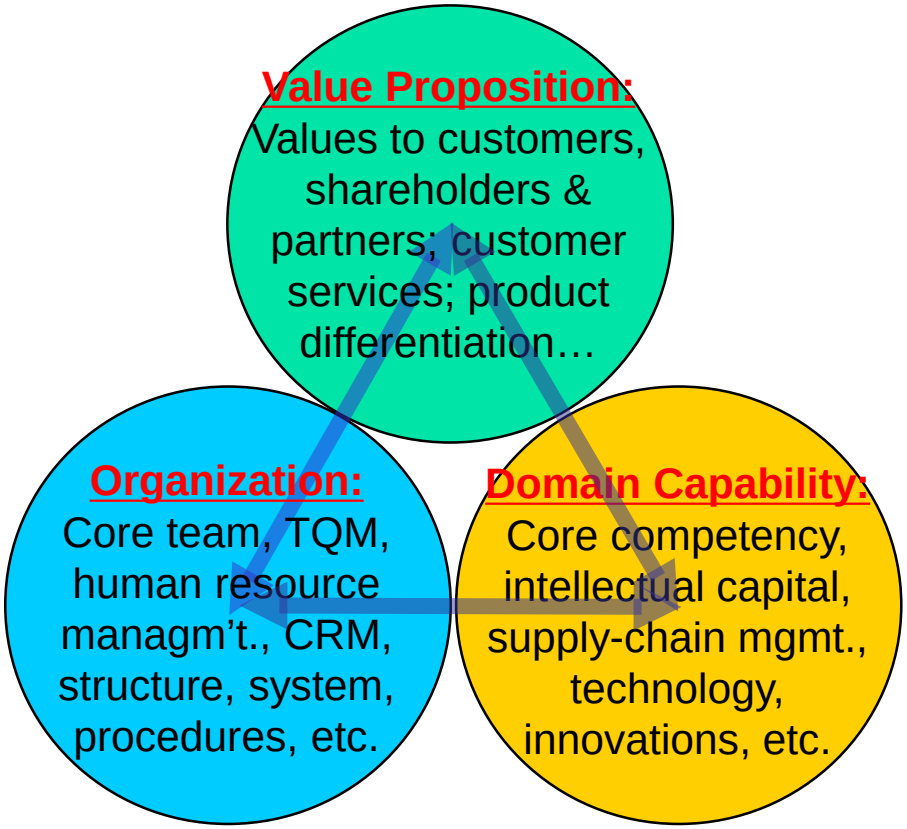
- **Others in the Top 10 included Broadcom, Intel, Micron, Sandisk, Texas Instruments and Xilinx (All multi-billion$ companies)**

AK comment: Considering the facts that NM is much less than 1/10 of the size (in revenue) of the other 9 top-ranking companies and much younger (<10 years old), it is a crowning achievement! Likewise, "ipIQ" rated NM's portfolio the best for a medium size (~$100M) high-tech company worldwide in its "Patent Scorecard 2006" report with the 2nd highest CII (current impact index).

Mkt. Cap.: US$250M @ 2004 IPO => US$3.7B @ 2011 M&A (14.8X in 7 years = >46% CAGR)

Basic Requirements for Competitiveness

- The foundation for Global Competitiveness are:
  - Value Proposition (demand-side/external critical success factors), Domain Capability/knowledge (supply-side/internal critical success factors) and Organization (the means to meet the demand with the supply)



The Foundation for Global Competitiveness

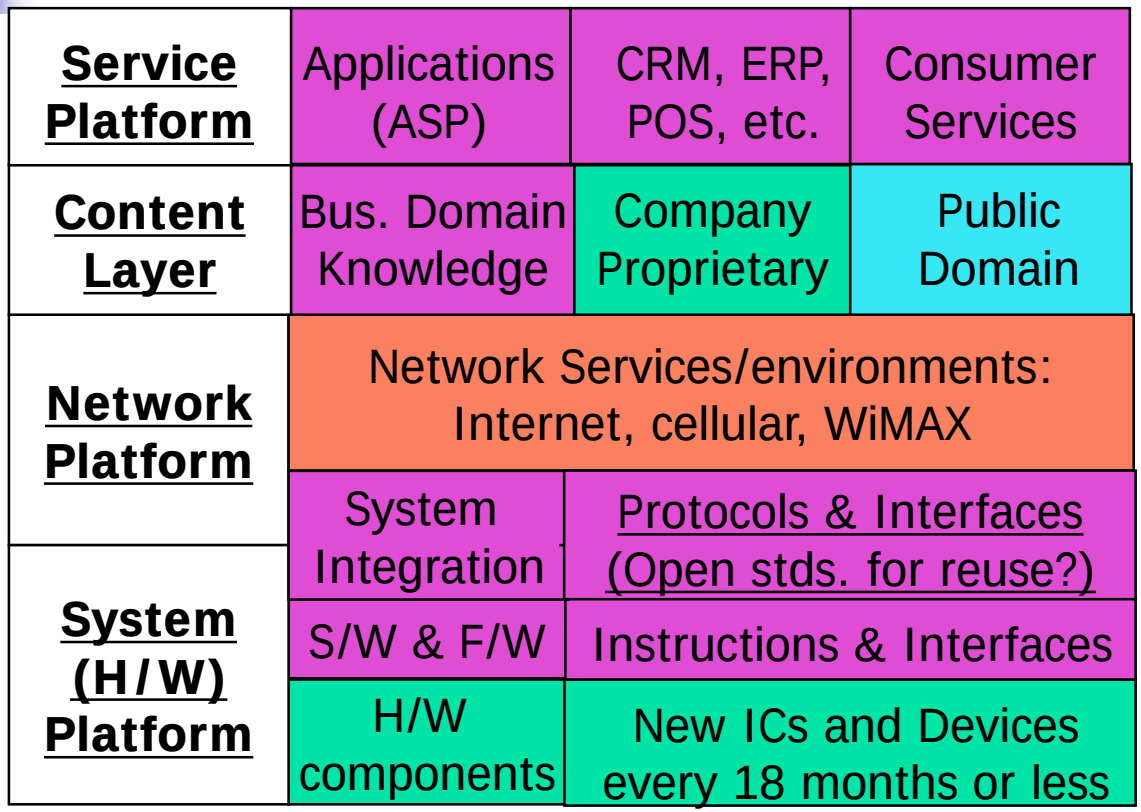
The Key to Success of "NETL"

- Value proposition (with 2nd highest Pipeline Impact index):
  - Enable IT service providers to provide high-value mission-and-time-critical differentiating services
  - Enable cost-effective IT network security end-to-end up to Layer-7 content filtering level at maximum (backbone wire) speed
- Domain capabilities/knowledge (being the sole leader in its domain):
  - Fully capable of providing cost-effective turn-key best-of-class system-level "QoS" solutions from H/W level to service level
  - Capable of addressing all relevant mission-and-time-critical applications within its domain of expertise
  - Comprehensive IP portfolio to further enhance innovation leadership
- Organization/execution:
  - A corporate culture striding for continuous innovations
  - Product development for 1st silicon success
  - All-out efforts for securing design wins
  - Product introduction for best possible time-to-market
  - Product engineering for best possible time-to-mass production
  - Corporate dedication to total customer satisfaction

Path to Success!

- Great companies take advantage of the 2 engines driving Information Age!
  - NetLogic Microsystems are benefiting greatly from both Moore's Law and Metcalfe's Law
- For all IC manufacturers, the questions are:
  - Does the Moore's law work for you or against you?
    - Does the migration to a new technology node give you better performance, lower cost, more functionality, lower power and more profit opportunities?
  - Does the Metcalfe's Law work for you or against you?
    - Are your solutions (architecturally) scalable with the increasing bandwidth requirements?
    - Are your solutions independent of the carrier characteristics?
    - Do your solutions provide differentiating (mission-&-time-critical) values (like "QoS" and security)?

IT Business Areas & Opportunities



High-valued services with good business potentials

Network environment given (by providers) or to be set up

Data mining from public domain to add values

Factors given or to be used "as is" – not to reinvent

Moore's Law and Metcalfe's Law (acting on H/W and Network Platforms respectively) are fuelling on-going IT systems re-engineering for global improvements (changes) like magma shaping earth's crust's movements

NetLogic Microsystems' Mkt. Performance

- 80% to 100% increase in the past 2 years during the worst global economic crisis.
- Mkt. Cap. has increased to $2.02B from ~$250M (in 2004): 8X in 6 years.

Target Model*

	Target Model	Actual Q1 -10	Guidance Q2-10 ***
Revenue	100%	100%	100%
Gross Margin	65%	66%	66%
R&D	28%	25%	28%
SG&A	12%	15%	13%
Operating Expense	40%	40%	41%
Operating Income	25%	26%	25%

AK Comment: Need GM @ ~65% to sustain R&D efforts @ ~30% for continuous world-class Independent Innovation

* Non-GAAP

*** Based on forward-looking guidance provided on NETL's First Quarter 2010 Earnings Call on April 29, 2010