Ingredients for a Successful Fabless Indian Semiconductor Industry

Wally Rhines
Chairman & CEO
Mentor Graphics
February 7, 2012
Semiconductor Frustrations Abound

“...[entrepreneurial business] in India has been held down for years...[due to] big problems with transport, infrastructure, government intervention at national and local level, swarming chaos and confusion in the streets, blatant poverty.”

BBC News Business 6/26/2011

“Time has come to demonstrate our leadership position by building our own capabilities in IC design, IC fabrication and design & manufacturing of electronics products”

Ajay Kumar
2/21/2011 Joint Secretary, Dept. of Information Technology

“I recall a discussion in mid-2005 where an industry expert mentioned that fabless was the way forward for the Indian industry! Between then and now, fabs were supposed to come up, but they failed. Nevertheless, one must not give up hope!”

Pradeep Chakraborty’s Blog, April 7, 2011

“India's portion of a $250 billion semiconductor market is marginal. It has only two fabless startups, its innovation record as measured by the number of patents granted is dismal, it suffers from a dearth of Ph.Ds and high attrition rates, what talent it does have is undisciplined and it let China dominate completely in systems manufacturing.”

EE Times Asia 1/12/2009
Semiconductor Frustrations Abound

“India, where the demand for chips goes in billions both in revenue and shipment, needs companies [like Cosmic Circuits] to balance its trade deficit in electronics hardware. Its time for VLSI design service companies in India to get into own product development.”

EE Herald, 2011

“Consumption of electronics in India is all set to cross $400 billion by 2020... threatening to cause a major balance of payments crisis by outpacing oil import bill. the country needs to build an ecosystem to avert such crisis.”


“Approximately 95% of the software and hardware companies in India... base their businesses around outsourcing, while the remaining 5% are Indian-American owned high technology product development startups that are similar to those of Silicon Valley.”

Go4 Funding

“The Changing Landscape of Indian Entrepreneurship and Angel Investments”

“The proposed national policy... aims to address the huge gap between locally produced electronics and the domestic demand for electronics in India.”

Jaswinder Ahuja, Cadence Design Systems India
Semiconductor Frustrations Abound

- Too much focus on services
- Multinational company dominance
- Perceived lack of progress
- Perceived lag compared to China
- Lack of foundry infrastructure
- No clear dominant indigenous Indian company
SEMICONDUCTOR INDUSTRY STRUCTURE
Top 50 Semiconductor Companies, 2011

- 12 are fabless
  - Qualcomm #8
  - Broadcom #11
  - AMD #12
  - Nvidia #18

- 4 are foundries
  - TSMC #3
  - UMC #20
  - GlobalFoundries #21

Headquarter Locations
- 24 US ... 48%
- 10 Japan ... 20%
- 8 Taiwan ... 16%
- 5 Europe ... 10%
- 2 South Korea ... 4%
- 1 China ... 2%
Fabless IC Revenue Continue To Grow

Source: IC Insights, 2012
Fabless Market Gaining in Overall Market

Fabless IC Sales

% of Total IC Revenue

Source: IC Insights, 2012

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Fabless Revenue is Highly Concentrated

Revenue From Top 148 Fabless Semiconductor Companies
(Tracked by Gartner 2010)

<table>
<thead>
<tr>
<th>Fabless Revenue Distribution</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Top 1 Company</td>
<td>11%</td>
</tr>
<tr>
<td>Top 5 Companies</td>
<td>43%</td>
</tr>
<tr>
<td>Top 10 Companies</td>
<td>58%</td>
</tr>
<tr>
<td>Top 25 Companies</td>
<td>74%</td>
</tr>
<tr>
<td>Top 50 Companies</td>
<td>86%</td>
</tr>
<tr>
<td>Top 75 Companies</td>
<td>92%</td>
</tr>
<tr>
<td>Top 100 Companies</td>
<td>97%</td>
</tr>
</tbody>
</table>

Source: Gartner, Top Fabless Revenue From Shipments of Total Semiconductor, 2011

WCR, ISA Vision Summit, February 2012
**Leading Fabless Companies Specialize and Average ~23 Years Since Formation**

<table>
<thead>
<tr>
<th>Fabless Company</th>
<th>Headquarters</th>
<th>2011 Rev. ($M)</th>
<th>Technology</th>
<th>Founding</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualcomm</td>
<td>US</td>
<td>9,488</td>
<td>Wireless/CDMA</td>
<td>1985</td>
<td>26</td>
</tr>
<tr>
<td>Broadcom</td>
<td>US</td>
<td>7,146</td>
<td>Wireless/Broadband</td>
<td>1991</td>
<td>20</td>
</tr>
<tr>
<td>AMD</td>
<td>US</td>
<td>6,567</td>
<td>MPU</td>
<td>1969</td>
<td>42</td>
</tr>
<tr>
<td>Nvidia</td>
<td>US</td>
<td>3,978</td>
<td>GPU</td>
<td>1993</td>
<td>18</td>
</tr>
<tr>
<td>Marvell</td>
<td>US</td>
<td>3,418</td>
<td>MPU/DSP</td>
<td>1995</td>
<td>16</td>
</tr>
<tr>
<td>MediaTek</td>
<td>Taiwan</td>
<td>2,990</td>
<td>Wireless/Storage</td>
<td>1997</td>
<td>14</td>
</tr>
<tr>
<td>Xilinx</td>
<td>US</td>
<td>2,249</td>
<td>FPGA</td>
<td>1984</td>
<td>27</td>
</tr>
<tr>
<td>Altera</td>
<td>US</td>
<td>2,052</td>
<td>FPGA</td>
<td>1983</td>
<td>28</td>
</tr>
<tr>
<td>LSI Corp.</td>
<td>US</td>
<td>2,040</td>
<td>Storage/Networking</td>
<td>1981</td>
<td>30</td>
</tr>
<tr>
<td>Avago</td>
<td>US</td>
<td>1,285</td>
<td>Broad-based Portfolio</td>
<td>~1960s</td>
<td>50+</td>
</tr>
<tr>
<td>Mstar</td>
<td>Taiwan</td>
<td>1,220</td>
<td>Wireless/Multimedia</td>
<td>2002</td>
<td>9</td>
</tr>
<tr>
<td>Novatek</td>
<td>Taiwan</td>
<td>919</td>
<td>Display/Multimedia</td>
<td>1997</td>
<td>14</td>
</tr>
<tr>
<td>CSR</td>
<td>Europe</td>
<td>840</td>
<td>GPS/Wireless</td>
<td>1998</td>
<td>13</td>
</tr>
<tr>
<td>ST-Ericsson</td>
<td>Europe</td>
<td>820</td>
<td>Wireless</td>
<td>~1960s</td>
<td>50+</td>
</tr>
<tr>
<td>Realtek</td>
<td>Taiwan</td>
<td>745</td>
<td>Networking/Peripheral</td>
<td>1987</td>
<td>24</td>
</tr>
<tr>
<td>HiSilicon</td>
<td>China</td>
<td>710</td>
<td>Networking/Digital Media</td>
<td>2004</td>
<td>20+</td>
</tr>
<tr>
<td>Spreadtrum</td>
<td>China</td>
<td>670</td>
<td>Wireless</td>
<td>2001</td>
<td>10</td>
</tr>
<tr>
<td>PMC-Sierra</td>
<td>US</td>
<td>655</td>
<td>Broadband/Storage</td>
<td>1984</td>
<td>27</td>
</tr>
<tr>
<td>Himax</td>
<td>Taiwan</td>
<td>625</td>
<td>Display/Multimedia</td>
<td>2001</td>
<td>10</td>
</tr>
</tbody>
</table>

*Source: IC Insights “McClean Report 2012”*
Total Number of “Fabless Companies”

Approximate Number of Fabless Companies - GSA

Number of Companies

- Year: 1996 - 2010
- Number of Companies: 50 - 1,600


WCR, ISA Vision Summit, February 2012
The Fabless Universe

- “...over 1,600 fabless IC companies worldwide”
  - “Fabless Semiconductor Industry Trends” - Distinguished Lecture Series
    - Author of Fabless Semiconductor Implementation, McGraw Hill
    - Dr. Rakesh Kumar, TCX – Technology Connexions

- “...close to 1,300 fabless companies worldwide”
  - “How Fabless Companies Drive Tech”, December 29, 2010
    - Jodi Shelton, President & Co-founder of the GSA

- Gartner
  - 151 companies

- IC Insights
  - 133 Companies

## The Continuum

<table>
<thead>
<tr>
<th>IDM Model</th>
<th>Fabless Model</th>
<th>SIP Model</th>
<th>Design Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Chip</td>
<td>Design Chip</td>
<td>Design Block</td>
<td>Design Services</td>
</tr>
<tr>
<td>Manufacture (Internal)</td>
<td>Foundry (External)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Narrow Fabless Definition**

**Broad Fabless Definition**
The Continuum – Many Hybrid Models

IDM Model
Design Chip
Manufacture (Internal)

Fabless Model
Design Chip
Foundry (External)

SIP Model
Design Block

Design Services

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SIP Market Size & Forecast

Semiconductor IP

$ Millions


1,333 1,607 1,699 1,544 1,508 1,962 2,250 2,570 2,800 3,238 3,707

CAGR 8%

CAGR 14%

Source: IBS, IP - 9/2010

WCR, ISA Vision Summit, February 2012

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**SIP Revenue Distribution**

**Revenue From Top 50 Semiconductor IP Companies (Tracked by Gartner 2010)**

### IP Revenue Distribution

<table>
<thead>
<tr>
<th>Rank</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top 1 Company</td>
<td>35%</td>
</tr>
<tr>
<td>Top 5 Companies</td>
<td>59%</td>
</tr>
<tr>
<td>Top 10 Companies</td>
<td>70%</td>
</tr>
<tr>
<td>Top 25 Companies</td>
<td>82%</td>
</tr>
<tr>
<td>Top 50 Companies</td>
<td>92%</td>
</tr>
</tbody>
</table>

**Source:** Gartner, Semiconductor Design IP Revenue Worldwide, 2011

WCR, ISA Vision Summit, February 2012
Leading SIP Players Specialize and Average 22 Years in Business (Similar to Fabless)

<table>
<thead>
<tr>
<th>Fabless Company</th>
<th>Headquarters</th>
<th>2010 Rev. ($M)</th>
<th>Technology</th>
<th>Founding</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARM Holdings</td>
<td>UK</td>
<td>575.9</td>
<td>MPU Cores</td>
<td>1990</td>
<td>21</td>
</tr>
<tr>
<td>Synopsys</td>
<td>US</td>
<td>231.6</td>
<td>Broad Portfolio of Cores</td>
<td>1986</td>
<td>25</td>
</tr>
<tr>
<td>Imagination Technologies</td>
<td>UK</td>
<td>92.6</td>
<td>Mobile Graphic/Digital Radio</td>
<td>1985</td>
<td>26</td>
</tr>
<tr>
<td>MIPS Technologies</td>
<td>US</td>
<td>85.3</td>
<td>MPU Cores</td>
<td>1984</td>
<td>27</td>
</tr>
<tr>
<td>Ceva</td>
<td>US/Israel</td>
<td>44.9</td>
<td>Memory</td>
<td>2002</td>
<td>9</td>
</tr>
<tr>
<td>Rambus</td>
<td>US</td>
<td>41.3</td>
<td>Wired &amp; Wireless</td>
<td>1990</td>
<td>21</td>
</tr>
<tr>
<td>Silicon Image</td>
<td>US</td>
<td>36.0</td>
<td>Wired &amp; Wireless</td>
<td>1995</td>
<td>16</td>
</tr>
<tr>
<td>Tensilica</td>
<td>US</td>
<td>31.5</td>
<td>MPU Cores</td>
<td>1997</td>
<td>14</td>
</tr>
<tr>
<td>Faraday Technology</td>
<td>Taiwan</td>
<td>18.3</td>
<td>Broad Portfolio of Cores</td>
<td>1993</td>
<td>18</td>
</tr>
<tr>
<td>VeriSilicon Holdings</td>
<td>China</td>
<td>16.4</td>
<td>Multimedia &amp; Wireless</td>
<td>2002</td>
<td>9</td>
</tr>
<tr>
<td>Sarnoff Corp.</td>
<td>US</td>
<td>16.0</td>
<td>Misc. Cores &amp; Technologies</td>
<td>1942</td>
<td>69</td>
</tr>
<tr>
<td>MoSys</td>
<td>US</td>
<td>16.0</td>
<td>Memory &amp; I/O</td>
<td>1991</td>
<td>20</td>
</tr>
<tr>
<td>Sonics</td>
<td>US</td>
<td>15.9</td>
<td>On-Chip Communications</td>
<td>1996</td>
<td>15</td>
</tr>
<tr>
<td>Gennum</td>
<td>Canada</td>
<td>14.9</td>
<td>Multimedia &amp; Data Communications</td>
<td>1973</td>
<td>38</td>
</tr>
<tr>
<td>Zoran (acquired by CSR in 2011)</td>
<td>US</td>
<td>13.8</td>
<td>DSP</td>
<td>1983</td>
<td>28</td>
</tr>
<tr>
<td>Kilopass Technology</td>
<td>US</td>
<td>13.0</td>
<td>Memory</td>
<td>2001</td>
<td>10</td>
</tr>
<tr>
<td>Ubiquitous</td>
<td>Japan</td>
<td>12.0</td>
<td>Networking</td>
<td>2001</td>
<td>10</td>
</tr>
</tbody>
</table>

Source: Gartner, Semiconductor Design IP Revenue Worldwide, 2011
Source: Gartner, Semiconductor Design IP Revenue Worldwide, 2011
INDIA IN THE SEMICONDUCTOR INDUSTRY CONTINUUM
India Is in the top 5 Semiconductor Design Locations Worldwide (SIP + Fabless + Design Services)

Source: India Semiconductor Association “Study on semiconductor design, embedded software and services industry” April 2011
India’s Fabless Company Sample – Narrowly Defined

Source: Design & Reuse Portal Silicon IP Vendors, 2012
India’s Fabless Company Sample – More Broadly Defined

Source: Design & Reuse Portal Silicon IP Vendors, 2012
WCR, ISA Vision Summit, February 2012
India is Already a Leading Source of SIP

SIP Company Headquarters Distribution by Country

- US, 44.8%
- India, 5.3%
- UK, 5.5%
- Taiwan, 2.9%
- China, 3.1%
- Japan, 3.3%
- Israel, 3.5%
- France, 4.3%
- Germany, 4.9%
- Canada, 4.9%
- Others, 17.7%

Not corrected for those companies that have a bulk of their resources in India with small headquarter operations in other regions.

Source: Design & Reuse Portal Silicon IP Vendors, 2012

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Evolving from Design Services to Fabless Powerhouse

- 1985 initially offered contract R&D services
  - Seven industry veterans launched a new startup company
  - First employees worked from an office above a dry cleaning shop and a pizza restaurant

- 1988 company launched its first product

- 1991 Qualcomm went public and revolutionized the wireless communications industry
India Has Built a Foundation for a Fabless Future

<table>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

- **3-5 Logos**
  - Leader’s Average
  - **23 years** in Business

- **~30 Logos**
  - Leader’s Average
  - **22 years** in Business

- **40+ Logos**
INDIA CAN BE THE NEXT GREAT FABLESS INCUBATOR
India Has the Right Foundation

- Worldwide leadership with the most influential design teams in the world
India Has the Right Foundation

- Worldwide leadership with the most influential design teams in the world

— “In 2003, 100 foreign companies had established R&D facilities in India... By 2009, the number had grown to 750.”

– Thirumalachari Ramasami
Head of India’s Department of Science and Technology
Top Destination for Foreign Investment

- India continues upward trend in Foreign Direct Investment Confidence Index

- And is the world’s top destination for outsourcing activities
India Impact on U.S. Offshore R&D

Where Are The U.S.’s Offshore R&D Operations?

<table>
<thead>
<tr>
<th>Region</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>35%</td>
</tr>
<tr>
<td>China</td>
<td>35%</td>
</tr>
<tr>
<td>India</td>
<td>26%</td>
</tr>
<tr>
<td>North America</td>
<td>23%</td>
</tr>
<tr>
<td>Rest of World</td>
<td>17%</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>12%</td>
</tr>
<tr>
<td>Japan</td>
<td>10%</td>
</tr>
<tr>
<td>Other Asia</td>
<td>10%</td>
</tr>
</tbody>
</table>

Source: Battelle, R&D Magazine Survey

Where U.S. Firms Plan to Expand R&D Operations

<table>
<thead>
<tr>
<th>Region</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>30%</td>
</tr>
<tr>
<td>North America</td>
<td>24%</td>
</tr>
<tr>
<td>India</td>
<td>24%</td>
</tr>
<tr>
<td>Rest of World</td>
<td>22%</td>
</tr>
<tr>
<td>Europe</td>
<td>16%</td>
</tr>
<tr>
<td>Other Asia</td>
<td>11%</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>10%</td>
</tr>
<tr>
<td>Japan</td>
<td>6%</td>
</tr>
</tbody>
</table>

Source: Battelle, R&D Magazine Survey
India’s Research Publications Increasing Rapidly

India's Increasing Research Output

Source: Thomson Reuters

India Has the Right Foundation

- Worldwide leadership with the most influential design teams in the world
- One of the richest pools of creative engineering resources and educational institutions in the world
Rich pool of Well-Educated Engineering Talent

- Strong talent pool

- With second highest number of university graduates per year

- And a growing number of engineers every year
Electronic Designers in India, On Average, Are... As Talented as US, Europe and Japan
Joint Entrance Examination (JEE) statistics 2011

- 468,280 candidates appeared for the 2011 IIT-JEE
  — 13,196 candidates qualified
- 9,627 seats were available at the 15 IITs, ITBHU and ISM Dhanbad

Source: JEE-2011 Report, Indian Institute of Technology Kanpur
http://www.iitk.ac.in/infocell/iitk/newhtml/Report%20JEE%202011_EDITED_Aug14
Picture from the Deccan Chronicle, October 4, 2011
70% of Recent IIT Graduates Stay in India - 35% of Those That Go Abroad Return

Source: IIT Alumni Impact Study 2008
# Engineer Demographics by Region

<table>
<thead>
<tr>
<th></th>
<th>North America</th>
<th>Europe</th>
<th>China</th>
<th>India</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean Age in Years</strong></td>
<td>45.3</td>
<td>43.3</td>
<td>30.8</td>
<td>31.2</td>
<td>43.8</td>
</tr>
<tr>
<td><strong>Mean Years of Engineering Experience</strong></td>
<td>19.07</td>
<td>17.51</td>
<td>6.6</td>
<td>8.1</td>
<td>18.8</td>
</tr>
<tr>
<td><strong>Mean Household Income</strong></td>
<td>$145,280</td>
<td>$104,464</td>
<td>$37,515</td>
<td>$38,473</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*Source: Electronic Engineering Times Salary & Opinion Survey 2011*
India’s Executive Talent is World Class – 2011

| Top Global Business Schools by Average GMAT Scores |
|---------------------------------|-------|
| IIM: Bangalore                  | 780   |
| IIM: Ahmedabad                  | 770   |
| Stanford University             | 726   |
| Harvard Business School         | 725   |
| Yale School of Management       | 718   |
| University of Pennsylvania: Wharton | 713   |
| Dartmouth College: Tuck         | 713   |
| UCLA: Anderson                  | 711   |
| Indian School of Business       | 710   |
| UC Berkeley: Haas School of Business | 710   |
| MIT: Sloan                      | 710   |
| University of Chicago: Booth    | 710   |
| Columbia Business School        | 709   |
| NYU Stern School of Business    | 708   |
| INSEAD                          | 702   |

India Has the Right Foundation

- Worldwide leadership with the most influential design teams in the world
- Richest pool of creative engineering resources and educational institutions in the world
- Capability to create multi-national fabless semiconductor companies
  - Majority of the work is in India
  - With some resources in the West
# Foreign “Flagged” Indian Companies
Also an Early Success – Some Examples

<table>
<thead>
<tr>
<th>Companies</th>
<th>Focus</th>
<th>Highlights</th>
</tr>
</thead>
</table>
| **Beceem Communications** | Mobile Broadband       | • $43.7 Million revenue in 2009  
• 22 US patents & 59 pending and 11 provisional patent applications  
• **Acquired by Broadcom for $316 million in 2010** |
| **QualCore Logic**        | Analog & Mixed-signal IP | • 400+ Analog/Mixed Signal & 35 Digital IP Cores  
• Leading Foundries: TSMC, UMC, TOWER and CSM  
• “IP/SOC -Outstanding Contributions to SOC Solution‖ ... 2009 UMC Award |
| **Redpine Signals**       | Wireless Networking    | • 600+ man-years in R&D -- Next-generation Wireless  
• 100+ patents, patent filings & disclosures on OFDM/MIMO  
• "Best Electronic System Design company - Startup"... Silicon India 2010  
• Among the “Best New Products & Companies” ... ESC 2009 |
| **HelloSoft**             | RISC-only VOIP         | • 30+ Patents related to IP-based communication  
• Named one of Top 100 Technology Companies by Silicon India in 2007  
• Selected as a Technology Pioneer by World Economic Forum in 2007 |
India Has the Right Foundation

- Worldwide leadership with the most influential design teams in the world
- Richest pool of creative engineering resources and educational institutions in the world
- Capability to create multi-national fabless semiconductor companies
  - Majority of the work is in India
  - With some resources in the West
- Growing pool of angel investors
  - In India
  - Also in the West with strong connections to India
VC Investment Activity is Recovering

Source: Venture Intelligence; Zinnov Analysis

VC Investments in India (2005 – 2010)

<table>
<thead>
<tr>
<th>Year</th>
<th>Deal Value</th>
<th>Number of Deals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>268</td>
<td>44</td>
</tr>
<tr>
<td>2006</td>
<td>508</td>
<td>94</td>
</tr>
<tr>
<td>2007</td>
<td>876</td>
<td>144</td>
</tr>
<tr>
<td>2008</td>
<td>740</td>
<td>125</td>
</tr>
<tr>
<td>2009</td>
<td>475</td>
<td>92</td>
</tr>
<tr>
<td>2010</td>
<td>540*</td>
<td>110*</td>
</tr>
</tbody>
</table>

*Estimated value

Source: Venture Intelligence; Zinnov Analysis

WCR, ISA Vision Summit, February 2012
CREATING A THRIVING FABLESS INFRASTRUCTURE IN INDIA
Key Ingredients to Generate a Thriving Fabless Infrastructure

1. Involvement and expertise with end equipment

“Only when Indian engineers are exposed to the full system, top down, can they see where the opportunities to innovate lie along the entire design chain.”

EE Times Asia 1/12/2009
http://www.eetasia.com/ART_8800559411_480200_NT_2c622a76.HTM
Key Ingredients to Generate a Thriving Fabless Infrastructure

1. Involvement and expertise with end equipment
2. Foster a culture that tolerates failure and minimizes bureaucratic barriers

“I have not failed 1,000 times. I have successfully discovered 1,000 ways to not make a light bulb.”

Thomas Edison
American Inventor

“I’ve failed more times than I have succeeded in all of the things I’ve tried. It’s just that every time I failed, I didn’t give up trying new things is what made me successful.”

Vinod Khosla
FailCon 2011

“I didn’t see it then, but it turned out that getting fired from Apple was the best thing that could have ever happened to me.”

Steve Jobs
2005 Stanford Commencement Address

“I’ve missed more than 9000 shots in my career. I’ve lost almost 300 games. 26 times, I’ve been trusted to take the game winning shot and missed. I’ve failed over and over and over again in my life. And that is why I succeed.”

Michael Jordan
Key Ingredients to Generate a Thriving Fabless Infrastructure

1. Involvement and expertise with end equipment
2. Foster a culture that tolerates failure and minimizes bureaucratic barriers
3. Don’t apologize for being dependent upon multinational companies

Source: RealInnovation.com "Outsourcing: Product Innovation from India: by Zinnov
http://www.realinnovation.com/content/c070219a.asp
Key Ingredients to Generate a Thriving Fabless Infrastructure

1. Involvement and expertise with end equipment
2. Foster a culture that tolerates failure and minimizes bureaucratic barriers
3. Don’t apologize for being dependent upon multinational companies
4. Grow entrepreneurial connections between India and companies in the U.S., Europe and Asia
Give It Time
Summary

- While fabless startups have declined substantially in the West during the past decade, they are growing in India.
- Given the time required to grow large fabless companies in the past, India should not be discouraged by current progress.
- India has key capabilities to stimulate growth of fabless companies:
  - Design services companies
  - Design engineering expertise and innovation
  - Returning entrepreneurs
  - Educational system