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Advanced Technology Investment Company (ATIC): a destination, global champion

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Ibrahim Ajami looked out of the plane window as it descended into Abu Dhabi International airport. He was on a trip around the world: Abu Dhabi – Germany – New York – Singapore – Abu Dhabi. The early morning sun hit HQ (the unique round shaped building on the edge of Yas Island, Abu Dhabi) and the windows lit up for a moment with the rich colors of a fiery sun. Ibrahim contemplated the progress the Advanced Technology Investment Company (ATIC) had made in its short three years of existence since 2008 with him in charge as the Chief Executive Officer (CEO). From a company of two individuals, it had grown to almost 100 employees. It was managing assets valued at over US\$ 40 billion and had over 10,000 employees spread over eight manufacturing plants and sites in four countries. The bigger challenge for ATIC as a flagship destination champion was to find ways to quickly kick-start the economic and social transformation of the destination, in line with the Abu Dhabi Vision 2030[1] in a healthy and meaningful way. Second, as ATIC increased its reach globally in terms of acquisitions and customers, it needed to find ways to integrate potentially orthogonal cultures to create a cohesive Multi-National Company (MNC) which would be the vehicle for change – in this case it was GLOBALFOUNDRIES. The biggest challenge according to Ibrahim is “How could ATIC play a role in positioning the UAE, particularly Abu Dhabi in the Middle East, as a strong contender for technology innovation and high technology manufacturing.”

1.1 Advanced technology investment company

1.1.1 ATIC – a strong beginning

The Mubadala Development Company was started by the Government of Abu Dhabi in 2002 with a mandate to facilitate the diversification of Abu Dhabi’s economy and transform the Emirate into a knowledge-based global economy. In 2008, Mubadala played a key role in helping to launch ATIC as an element of Abu Dhabi’s long-term strategy to diversify its economy through investments in high-technology sectors. In 2011, ATIC became a wholly owned business of Mubadala. ATIC looked at its investments through the same rigor that Mubadala did – making sure all investments adhered to strict financial and operational discipline. ATIC had a clear and single purpose at its inception: “To deliver superior financial returns to their shareholder by responsibly and sustainably investing in, and building, leading technology companies around the world.” Though the initial focus was on the semiconductor industry, ATIC’s future scope was to become global, focusing on leading technology companies and centers in Europe, the USA and Asia.

1.1.2 No stranger to overcoming the insurmountable

Prior to becoming the CEO of ATIC, Ibrahim worked at Mubadala as the Associate Director of the Acquisitions Unit. During his four years of tenure there, he was instrumental in several significant and high-profile acquisitions including Pearl Energy (Singapore), Carlyle Investment (USA); Related Real Estate Company (New York, USA). Among the many sectors identified for diversification was the high-technology semiconductor industry with which

Ibrahim was familiar, having worked in Silicon Valley, most notably with Packard Bell/NEC. Some positive aspects of this industry were first from a manpower point of view – it requires a high-wage, high-expertise, high-productivity and high-technology combination. Second, it is not a labour intensive industry given the high degree of automation. There were some challenges also associated with this industry. It was a highly competitive global industry. Only a handful of companies had made money in this sector. Only the leading players in the segment reaped most of the profits. It is a very cyclical sector, subject to booms and busts, which means you need resilience. Finally, the advanced technology sector requires a massive amount of capital investments.

Considering the pros and cons, the leadership felt that this was an investment that played to Abu Dhabi's strengths – it was capital intensive, it would provide future employment for the citizens, create additional diversification and aid in furthering the country's desire to be a knowledge-based economy. Furthermore, a unique opportunity presented itself with respect to Advanced Micro Devices (AMD). Ibrahim headed Mubadala's initial acquisition of an 8.1 per cent stake in AMD in 2007 which then led to the joint venture transaction between ATIC and AMD to establish GLOBALFOUNDRIES in January 2009. The strategy was a bit different from previous Mubadala investments as here they were building a global champion that would act as a catalyst for creating an industry cluster in Abu Dhabi. They knew at the onset that this opportunity required time. In 2008, when ATIC was launched, Ibrahim had a team of one other person.

Ibrahim said: "Good investors do two things – they deploy their capital at the right time and they manage their investments really well so they can exit and get their return." At this time, the focus was to separate and build GLOBALFOUNDRIES from AMD and to build ATIC. Though this task of creating ATIC and building GLOBALFOUNDRIES seemed challenging, Ibrahim believed it was possible despite the odds. The opportunity was immense as this semiconductor sector had a huge growth potential and customers in the industry were looking for another significant player to help balance the supplier dynamics. For Ibrahim, it came down to a strategy of execution and his formula was very simple. "Rule No. 1: It's all about the people", so Ibrahim went and "recruited some very talented people, encouraged and attracted them to the platform based on the long-term vision." Ibrahim believed he needed to have a value centered and results oriented organization – an organization "where the real differentiator is people [...] that gives you the long-term sustainable competitive advantage." A lot of time was devoted to people development, making sure that the right people are in the right places and creating an environment high on values. The ATIC values and conduct framework that drove the organizational culture is shown in Table I.

For Ibrahim, there were a few critical components to success for ATIC:

- Preparing Abu Dhabi as a battleground for the semiconductor industry: developing policies, infrastructure, talent, human capital and the seamless working of the various constituents like the private sector, government sector and education. This had to also contribute to the dual bottom line. What this meant was that in addition to the financial objective, ATIC had a socio-economic objective to the Government of Abu Dhabi and hence UAE.
- Building GLOBALFOUNDRIES to succeed: making sure that there was synergy between the three cultures in which the plants operated – Germany, Singapore and the USA – and keeping the competition with cooperation between the locations healthy.
- Creating a new culture that weaved the ATIC vision through the companies: identifying the best qualities of each asset and promoting it across the other assets to create one integrated culture. For example, Chartered from Singapore was a thrifty company with strong customer service. On the other hand, GLOBALFOUNDRIES had a strong leading-edge technology legacy. All that was required was the diligence; the strong belief in the vision; stakeholder management and a tremendous amount of education. You needed foresight, energy and commitment knowing that Abu Dhabi would take five years to be ready and the markets of Germany, Singapore and the USA needed to be sustained and built up.

Table I ATIC values and conduct framework

<i>The values we embrace</i>	<i>The conduct we expect</i>
<p><i>Accountability and excellence</i> We are focused, disciplined and rigorous in everything we do We set and meet aggressive targets We have a passion for high performance</p>	<p><i>Thoughtful</i> Empower sound decision making by challenging each other, cultivating frank debate and seeking different perspectives Have the confidence to be open to ideas from anywhere Practice innovative thinking by challenging the status quo Always be mindful of optimizing outcomes for ATIC and Abu Dhabi</p>
<p><i>Impact</i> We have a clear vision of where we are going We maintain a long-term orientation Our goal is to never stop growing and developing professionally</p>	<p><i>Collaborative</i> Be a player for all seasons with intensity and drive; invigorate and support each other Lead by being coaches and mentors to help others develop more readily Provide and solicit timely and caring feedback, addressing sensitive topics through personal interaction Foster trust and respect – be open, responsive and transparent with no hidden agenda</p>
<p><i>Integrity and humility</i> We embrace and cherish the responsibility that has been granted to us We respect and honor the diverse cultures we represent and work with We strive to act always with honesty and principle</p>	<p><i>Committed</i> Speak with one voice – have strong alignment with each other and with the company's vision and goals (internally and externally) Be a role model of our culture and values by living them every day Protect confidentiality of each other and our key stakeholders Work hard and strive to achieve work-life balance, or mission is a marathon, not a sprint</p>

1.2 ATIC's core assets

We believe, simply, that it comes down to our three core assets – our patient capital philosophy, our perspective and our people.

1.2.1 CORE ASSET 1: patient capital philosophy

Daniel Durn was the Executive Director leading the Investment and Strategy Unit of ATIC. Daniel had extensive Mergers and Acquisition (M&A) deal experience in a variety of technology-related sectors and prior to joining ATIC worked as an investment banker and a member of the Merger Leadership Group at Goldman Sachs. He joined ATIC at the very beginning of its formation having worked in the M&A field with Mubadala as his client. When he was offered his current job, he jumped at the opportunity and left the USA to join the company.

Daniel believed that you create the opportunities by fully understanding the market needs. He looked after investments (especially identifying future opportunities) and divestments, making sure ATIC operated in the advanced technology sector. The viewpoint in ATIC was that patient capital investments were determined by long-term success (five to ten-year horizon) and sound financial returns took place through a strategic, transformation approach versus a short-term, tactical and opportunistic investment. ATIC's capital base was underpinned by their shareholder's AA + rating. Currently, the key stakeholder was the Abu Dhabi Government and the funding entity was Mubadala. In 2010, the semiconductor

market was worth an estimated US\$300 billion as shown in Figure 1. The structural shift in the integrated device manufacturing industry to outsourcing; and the raising costs associated with manufacturing plants was one area ATIC sought to optimize in terms of value with their acquisitions as shown in Figures 1 and 2.

Figure 1 Semiconductors are at the heart of advanced technology

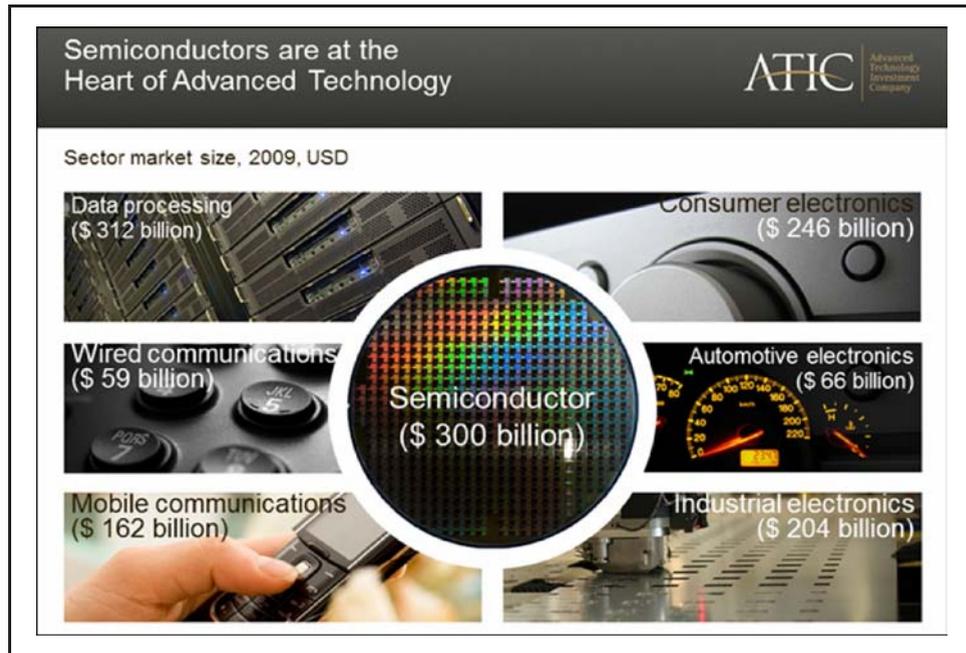
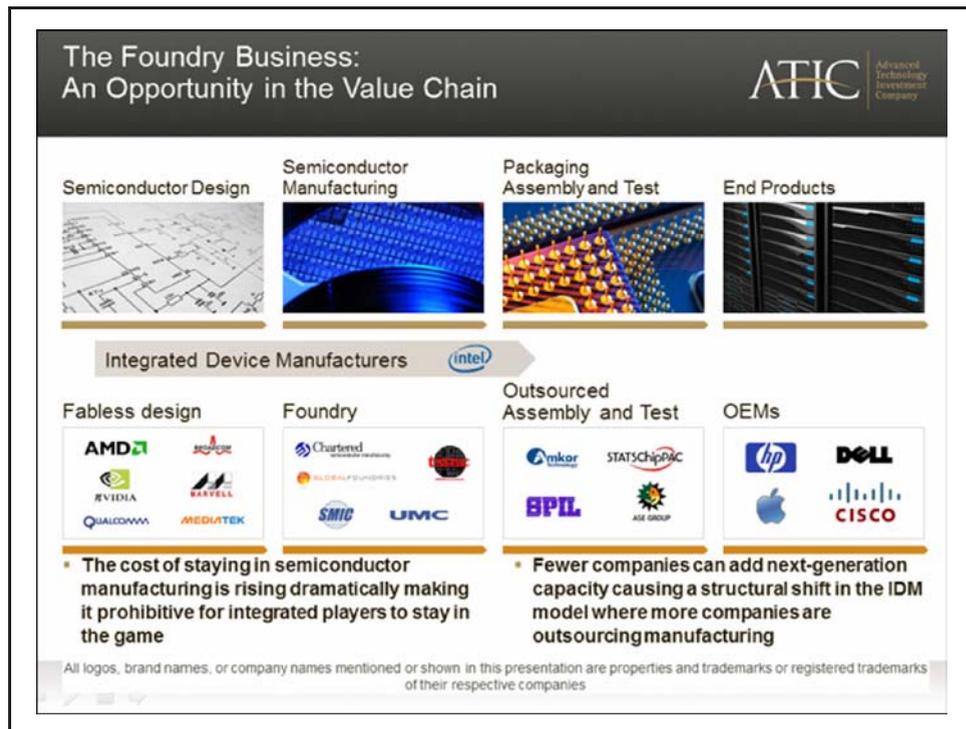


Figure 2 The foundry business: an opportunity in the value chain



ATIC's current portfolio extended across the foundry business. In Fabless Design, Mubadala invested in AMD which at that time was an integrated device manufacturer, with two types of companies embedded: one was a design company that designed the semiconductor and CPUs; and the other was a semiconductor wafer manufacturing firm. Historically this was how the industry operated but with time the cost of keeping both the design and manufacturing integrated into a mid-size company became prohibitively expensive and financially challenging. Only the largest companies in this sector were able to integrate both design and manufacturing as they needed the ability to have designs on the leading edge of technology (large R&D); and the ability to integrate that design into manufacturing. So eventually there was a disaggregation in the industry with companies retaining the design component as the investments in design were modest compared to the manufacturing business. On the manufacturing side, specialized manufacturers were merging together forming foundries and amortizing their investment costs over 100 different customers. This meant getting economies of scale. A peculiarity of this industry was that the top companies would always have a premium in the market place. This was because the fixed cost remained relatively constant at USD 5-9 billion, hence the company that could bring the technology to the market place first, would get the first mover advantage and recover costs faster by charging the premium for the average selling price. This premium could run to 50 per cent gross margins and 30 per cent operating margins. For example, Taiwan Silicon Manufacturing Company (TSMC) topped this industry; United Microelectronics Corporation (UMC) which was next had sales 1/3 of TSMC, SMIC and Chartered as followers found their combined sales was less than that of UMC (www.eeherald.com/section/news/nw100010277.html). Hence the margins and cash flows decreased dramatically for followers.

AMD was a good investment for ATIC as its R&D was on the bleeding edge of technology. Second in terms of manufacturing, AMD had proved that it was capable of being pushed to its limits in order to accommodate newer innovations. Typically in this industry, if one got design companies to create products using your wafer or silicon chip specifications, you were often guaranteed customers. With design and manufacturing, AMD had a strong differential advantage in the competitive marketplace. ATIC's journey began in October 2008, when Mubadala increased its initial investment of 8.1 per cent in AMD to 19.9 per cent. At this time ATIC and AMD created GLOBALFOUNDRIES by separating the design and manufacturing business. By Q3 2009, ATIC's stake in GLOBALFOUNDRIES was 69 per cent.

GLOBALFOUNDRIES was now one of the world's largest semiconductor manufacturers, committed to delivering a superior level of performance and innovation to benefit chipmakers, product manufacturers and consumers around the globe. According to Daniel what they did was not easy, "We bought a set of assets and now needed to create a company around those assets, which is a complex sequence of corporate transactions in the M&A world – asset divestiture from AMD to create GLOBALFOUNDRIES and then asset integration [between GLOBALFOUNDRIES and Chartered] [. . .] This takes a long time to mature into a fully stable platform that can be driven towards industry leadership." For ATIC the process was made more complex as the integration was less than 12 months after divestiture. This Merger of Equals was not easy to achieve given that the time frame and the complexity of the M&A. In normal circumstances, this would take ten years. ATIC had to keep in mind the peculiar trends present in this industry sector and make the asset a leader within this industry very quickly.

In Q4 2009, ATIC acquired 100 per cent of Chartered Semiconductor Manufacturing of Singapore. Chartered Semiconductor Manufacturing was at that time one of the Big 4 – in terms the world's most advanced semiconductor foundries. Chartered offered leading-edge and mainstream manufacturing which allowed its customers to create and deliver market-leading solutions. Another important factor for this acquisition was that the technology platform used for Chartered was the same as that used by GLOBALFOUNDRIES – no other player had the same technology platform. From ATIC's point of view, Chartered was a company that was known for servicing customers. Subsequently, it was a company with a shortage of investment funds which is crucial to update. GLOBALFOUNDRIES on the other hand had a large pool of capital to pursue a

leading edge roadmap and capacity investment, but lacked extensive customer relationships. This was a good merger of two assets – the Chartered mindset of extracting maximum value out of the business, good customer service combined with GLOBALFOUNDRIES high volume, microprocessor technology base and high capital could be used to create an organization with a new mindset – lean, high technology, customer focus with the scale. This synergetic value from the legacy business, and the consolidation of R&D costs from a merger point of view was enough justification for the acquisition cost. GLOBALFOUNDRIES was now one of the global forces to be reckoned in this business in terms of volume.

The typical stumbling blocks for mergers were that companies got emotionally involved and sometimes they overpaid for assets. Another stumbling block was underestimating risks of the business being acquired, the reactions from customers (positive, negative or neutral), or the risk incurred in integration (company culture, geographic culture). Proper diligence is needed in estimating these risks, or the valuation could be off. ATIC was trying to drive growth by deploying capital earlier in the growth cycle in advanced technology looking at mainly the horizontal industry but the adjacent vertical industry – software, hardware, communication technology, IT services, data centers are all potential growth centers. ATIC wanted be disciplined and systematic in their acquisitions; balancing opportunities but ensuring that this did not detract from building GLOBALFOUNDRIES. This is the philosophy behind the term “patient capital”: foundational investment, building a set of capabilities and leveraging that set of capabilities for capital deployment and destination building. ATIC had partnered with its asset management teams to drive change in the industry. Long term, ATIC planned to invest in upstream investments of design services and technology solutions.

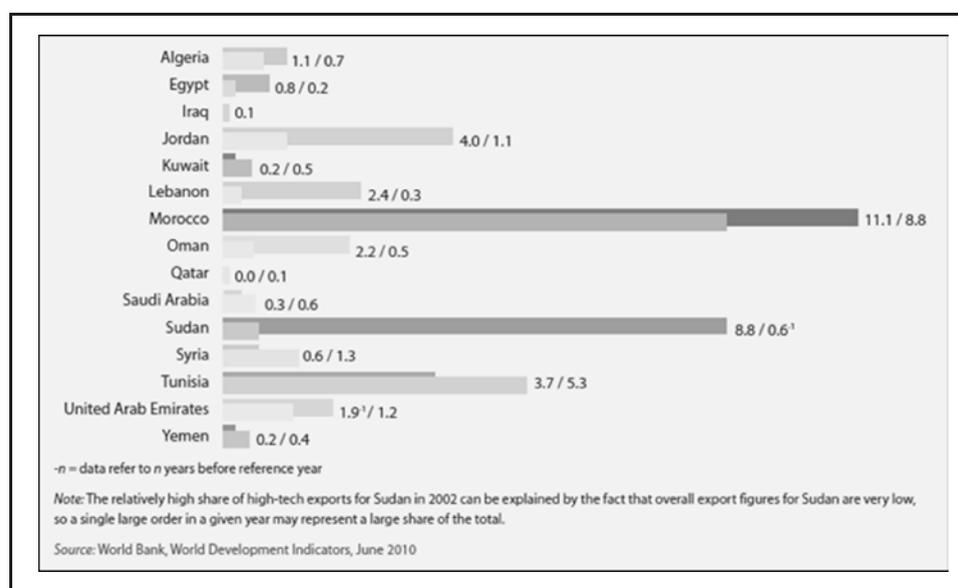
1.2.2 CORE ASSET 2: our perspective – an ecosystem approach

Advanced technology is a highly complex, competitive and dynamic industry that required in-depth knowledge and intelligent management on a global scale. ATIC was committed to evaluating the long-term potential of a company and the underlying merits of its technologies and investing in a smart, synergistic way that is beneficial to all concerned. The purpose of portfolio management is to look at existing assets and continue to improve value creation and performance – whether it means looking at new investments for existing assets, a new road map for sales and marketing, or new technologies. Currently, the largest asset was GLOBALFOUNDRIES. With the acquisition of Chartered, the Portfolio Management team looked at the Chartered integration with GLOBALFOUNDRIES and the future performance of GLOBALFOUNDRIES.

With all these acquisitions, by the end of 2009, GLOBALFOUNDRIES emerged as one of the top three semiconductor manufacturers in the world by revenue behind Taiwan Semiconductor Manufacturing Company and United Microelectronics Corporation. GLOBALFOUNDRIES had operations spread across three continents across 12 locations. GLOBALFOUNDRIES had five 200 mm fabs and two 300 mm fabs in production. They had over 150 customers worldwide. While the Dresden and Singapore ecosystem existed and continued to be supported, the New York ecosystem (Fab 8) was created through an investment of USD 4.5-5 billion to create a significant semiconductor player. Through this investment 1,500 direct jobs and over 5,000 indirect jobs were created in the USA at a time when a global recession was still going on. This helped create New York as a hub. When Fab 8 would be completed by August 2012 (estimated), it would be the largest leading-edge semiconductor foundry in the USA.

By March 2011, ATIC had committed over US\$10 billion (to acquire the former manufacturing assets of AMiD in Dresden, Germany; Chartered Semiconductor Manufacturing of Singapore and for the new fabrication facility in New York, USA). To prepare for an Abu Dhabi future advanced technology ecosystem, ATIC relied on the Abu Dhabi Economic Vision 2030 to make the emirate a commercial and innovative global force. This was ambitious looking at the share of high-tech exports in this sector and the future economic diversification strategy under Abu Dhabi Vision 2030 (Figure 3)[2]. The logic behind these acquisitions was the fact that countries with significant semiconductor clusters typically rank very high in world innovation

Figure 3 Percentage share of Arab high-tech exports in total manufactured exports (2002 and 2007) [2]



rankings and provide significant labour opportunities for their citizens (see Table II for more information). Countries that bore testament to this strategy were USA, South Korea, Japan, Taiwan, Singapore and China. Other countries that had been following this strategy were India, Brazil and Russia. ATIC wanted to bring in GLOBALFOUNDRIES as an anchor tenant to

Table II Opportunities and challenges affecting the realization of Abu Dhabi 2030 for ATIC

<i>Opportunities</i>	<i>Challenges</i>
Abu Dhabi Government: stable; forward looking and very tolerant to diverse cultures with a financial capability	UAE has a low R&D spend and Abu Dhabi yet had to create a policy for the same
Capacity for innovation: the UAE is the highest ranking Arab country in terms of its capacity for innovation ranking 27 out of 133 countries in 2009-2010	Low collaboration between the private, and government and education sectors: this is vital to the creation of an ecosystem
National manpower required: Emiratis are less than 20 per cent of the population and such an industry is not manpower intensive	Low number of full time researchers/million (this requires a long-lead time to develop and currently most of the capabilities are imported in the form of expatriates)
Opportunity to provide employment and high wages: about half the national population of UAE is below 15 years of age (opportunity to develop talent); estimated unemployment rate stands at 10 per cent (opportunity to provide jobs). As a highly skilled industry, the employment will provide high wages (attractive private sector job)	Low impact of research (patents, publications and citations) – This is more an effect of the previous two points
ICT adoption: UAE has a high ICT adoption showing comfort level with internet and mobile technology and infrastructure development	Intellectual property (IP) rules needed greater clarity and legal protection
UAE a trade hub: UAE was already a trade hub, which had two international air carriers operating in close proximity that would be required for supply chain management	UAE did not have any education body at the time of founding of GLOBALFOUNDRIES a degree/diploma focusing on micro-processing

Sources: Interviews with Key Managers in ATIC; Data from World Competitiveness Reports

Abu Dhabi having to become the global champion to create a destination transformation into a vibrant high-technology ecosystem.

As of June 1, 2011, ATIC began planning for a future technology center in Abu Dhabi that would support the company's long-term innovation plans and create the Middle East's first semiconductor foundry. The site (which is 3km² in area) would be near Abu Dhabi International Airport to give it access to the region's transport centres and educational facilities.

Sami Issa, the Abu Dhabi Ecosystem Executive Director defined his unique role as one that makes sure that the champion (GLOBALFOUNDRIES) is healthy and profitable so that ATIC was able to add the Abu Dhabi dimension into the existing vibrant ecosystem that includes the other geographies creating a synergy of multiple innovation houses. Sami had over 15 years of experience in the semiconductor industry where he has held diverse leadership positions with industry leaders such as Intel Corporation, Texas Instruments and Broadcom Corporation. Prior to joining ATIC, he was a director at Intel Corporation and was elected as the top 1 per cent of Intel's technical community. He had always wanted to work in an industry that could contribute to the creation of a knowledge economy. In summer 2008, while working at Intel, he heard about an opportunity to work at ATIC through a former colleague. For him it was like a dream come true so he moved to Abu Dhabi in March 2009. He says 60 per cent of his time is spent on enabling Abu Dhabi for the high-technology sector and another 40 per cent of his time is spent on portfolio development and strategy to ensure that the champion is healthy. Sami further clarified his role as a unique one, which contributes to the socio-economic bottom line. He says, "Looking at investments from a financial lens is what Wall Street does but that can be limiting. Another way of looking at investments is to take a macro-lens not a micro-lens. Looking at what is the [investment's] contribution to the GDP, education, etc. [...] are real wealth creating elements [...] it shows that government cares about its people through government funded investments. You really want to look holistically at investments."

This ecosystem approach which looked beyond the pure financial investment; looked instead at the investment into the destination, its people, its allied industries – to get a return on human capital, building a market, educating a society, changing the mindset, reforming policies, education and business environment regulations, creating a relevant R&D culture that reaches commercialization, creating global competitiveness for the population and nation and creating both long-term social and financial wealth for the citizens. This was the approach ATIC was taking. It was a transformational approach spearheaded by an organization (ATIC), which acted as a catalyst. ATIC was creating a global champion – GLOBALFOUNDRIES – which competed across the world, consolidating and expanding existing ecosystems and then potentially creating one in Abu Dhabi where GLOBALFOUNDRIES would be the global champion for this destination change.

The innovation and knowledge also needed to be supported by a mutually beneficial relationship with supporting industries, universities and R&D to optimize its impact. With Abu Dhabi, where a significant population was transient, this needed to be developed. ATIC was the entity tasked or mandated with enabling or forcing this transformational change. So while ATIC was certain of the long-term objective and the spillover effects of the investments, they had to identify how to measure the contribution to the socio-economic bottom line.

Sami says "We know it is a fantastic strategy to drive the transformation of a destination [...] Though we know the socio-economic benefits, there are no tools or mechanisms to quantify them unlike for the financial benefits. This is an area of research development – about how do you create the right language, which is equivalent to the financial language to measure and quantify the benefit of the investment. This is a new way of looking at investments." ATIC was creating a research-conducive environment by working closely with the Technology Development Committee on Intellectual Patent Policy, Science and Technology Innovation Policy and the Abu Dhabi Economic Council on Business Environment and Business Regulation. One test of having successfully created an R&D conducive environment would be when the innovations were relevant and could be commercialized. Second, ATIC had

partnered with the Semiconductor Research Corporation, an entity that has worked on creating an ecosystem in USA between industry and the education sector to replicate the same in Abu Dhabi. The test for a productive education system aligned to a nation's needs was when the students from those universities could work in the top MNCs globally. ATIC's asset GLOBALFOUNDRIES had planned to invest 950 million dollars in R&D across the world in Dresden, Singapore and New York.

To create a cluster, ATIC had invited senior managers of the semiconductor industry to visit Abu Dhabi and put their R&D entities in Abu Dhabi. This should become self-sustaining if done properly – governments fund research, educational institutions come up with excellent research orientated programs and hence excellent quality of students who get absorbed in the industry; industry funds research, GDP goes up and the system survives on its own. Abu Dhabi till recently did not have an allocation for research from its GDP budget though there was a small sum earmarked at the federal level. ATIC had been one of those organizations championing a science and technology policy that outlined recommended funding percentages to be spent at the government level to spearhead R&D. ATIC wanted to encourage research, convince people it should and could be done. Last but not least, was to create an entrepreneurial culture that would drive a self-sustaining ecosystem, create opportunities for employment, increase innovation and GDP.

Brian Lott was the Executive Director, Communications, for ATIC with more than 20 years of experience in global public relations. Brian describes his role simply as one that is “responsible for reputation both inside and outside.” On the industry side, ATIC had to communicate its value proposition to the industry as an investment company. The education was about the deployment of capital to create fabs which made leading edge technology. It was also an introduction to Abu Dhabi's vision to be a future leading advanced technology hub. In Fall 2010, 250 Semiconductor C-level executives were brought to the UAE for the first semiconductor conference in Abu Dhabi – The ATIC Semiconductor Vision Summit. Two days were spent understanding the role of Mubadala, role of ATIC and why Abu Dhabi was planning to enter into the industry. ATIC also got immersed within industry events to create a presence and educate the industry and current and potential customers. Another important part of the communications effort was the education of stakeholders in and out of Abu Dhabi. The idea was to take a dry topic like silicon wafer manufacturing and turn it into an inspirational story about future possibilities; a chance to participate as an employee, an entrepreneur, an educator or a member of society in nation building; an opportunity to create a start-up culture of entrepreneurship.

Internally the communication strategy focused on making each ATIC employee a brand ambassador that understood the vision, the industry, the terminology and ATIC's role in the Abu Dhabi Vision 2030. There were some challenges – for example, Arabic does not have a word for semiconductors so ATIC had to create a new word to begin this process and then extend this translation to the existing terminology. ATIC created a glossary and used those Arabic terms to educate the community about the industry. Another challenge was to use “one voice” to speak about the larger vision ATIC was involved with, especially when talking to customers, Abu Dhabi influencers and the media. For this an online Q&A portal was created that allowed employees to be proactive and read information and get the appropriate contents and terminology into their narrative.

Second, ATIC had been building the “Al Nokhba” brand (which means “The Elite” in Arabic) for educational initiatives. These campaigns were to appeal to a new generation of Emiratis and to create for the participants of the various human capital programs, a sense of identity and empowerment by working in a prestigious occupation and study in some of the most elite programs. Detailed research was conducted for these campaigns. It was important to understand the perspective of not only the students but also the parents and the community as the parents and family were a big influencer in this society. From a cultural point of view, it was important to understand the perceptions about the semiconductor working environment, about working overseas and if the uniform or “bunny suit” was appealing or not. The findings were used to create the campaigns. Some of the findings were: “There was a lot of pride associated with the industry; there was a lot of comfort around the uniform as it

was considered respectful and there was a lot of appreciation for high technology machines in the clean room as it was considered different from a typical manufacturing environment.” More importantly, many females thought that this was an industry they could advance their education and have a career. In a follow-up survey, 86 per cent of the population surveyed found the AI Nokhba brand popular.

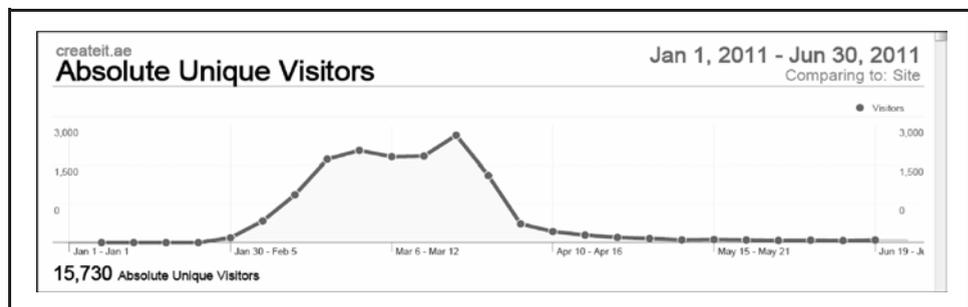
One of the reasons was the social media campaigns. Abu Dhabi had always traditionally spent on big media campaigns so this was a change in the communication strategy but proved immensely successful: there was a huge uptake on the AI Nokhba Fan page, there were twitter handles, they had a vision summit hash tag and many of the interns ATIC had chosen for their human capital development initiatives had blogs that made the campaigns viral (Figures 4 and 5). For its polytechnic campaign, ATIC created a slogan: “Stop trying to keep up with the new technology”. “Create It” and communicated to its target audience by the web site: www.createit.ae. The campaign micro-site had over 18,000 hits with 1,200 applications from primarily the science stream primarily of which 40 per cent were female applicants. The target audience was 1,500 Emiratis.

For building Fab 9, GLOBALFOUNDRIES needed to find the internal resources to fund the project. Traditionally, there were three sources of funds – cash flows from revenues; shareholder equity investments and debt markets. ATIC and Mubadala were involved with GLOBALFOUNDRIES in coming up with an appropriate strategy to ensure the project had sufficient capital. Bruce McDougall, Chief Financial Officer was involved from the ATIC side.

Figure 4 Some social media campaigns



Figure 5 Visitors to the createit.ae page (campaign period September 2010-March 2011)



As CFO, he is responsible for overall financial management of the company and its financial reporting and transparency. Prior to joining ATIC, Bruce worked as CFO of GLOBALFOUNDRIES and has worked in Mubadala Development Company on the EMAL International JV valued at US\$5.7 billion.

But financial funding is only one part of the holistic strategy ATIC was spearheading. Another important issue was that there were only two or three elements within ATICs direct control as some of the issues were policies or regulations that had to be worked out with other relevant stakeholders. ATIC “needs to create enablers for the transformation or it must remove barriers that would allow the transformation.” Sami, who was overall responsible for the Abu Dhabi ecosystem believed policy could be changed and the largest obstacle was actually convincing people that this transformation was crucial for long-term survival for a place that depends heavily on oil exports. He felt strongly that they do not have the luxury of time as the world was changing so rapidly and even now an alternative for oil could be developed. The areas ATIC focused on for destination change were – talent management through the human capital team; infrastructure; and all other physical infrastructure to enable the factory – like power, water, streets, housing, etc. and finally R&D. In this case, ATIC needed to enable R&D as it would take too long to grow organically to the level they required. Some changes were already taking place, for example some universities were already coming up with micro-chip designs.

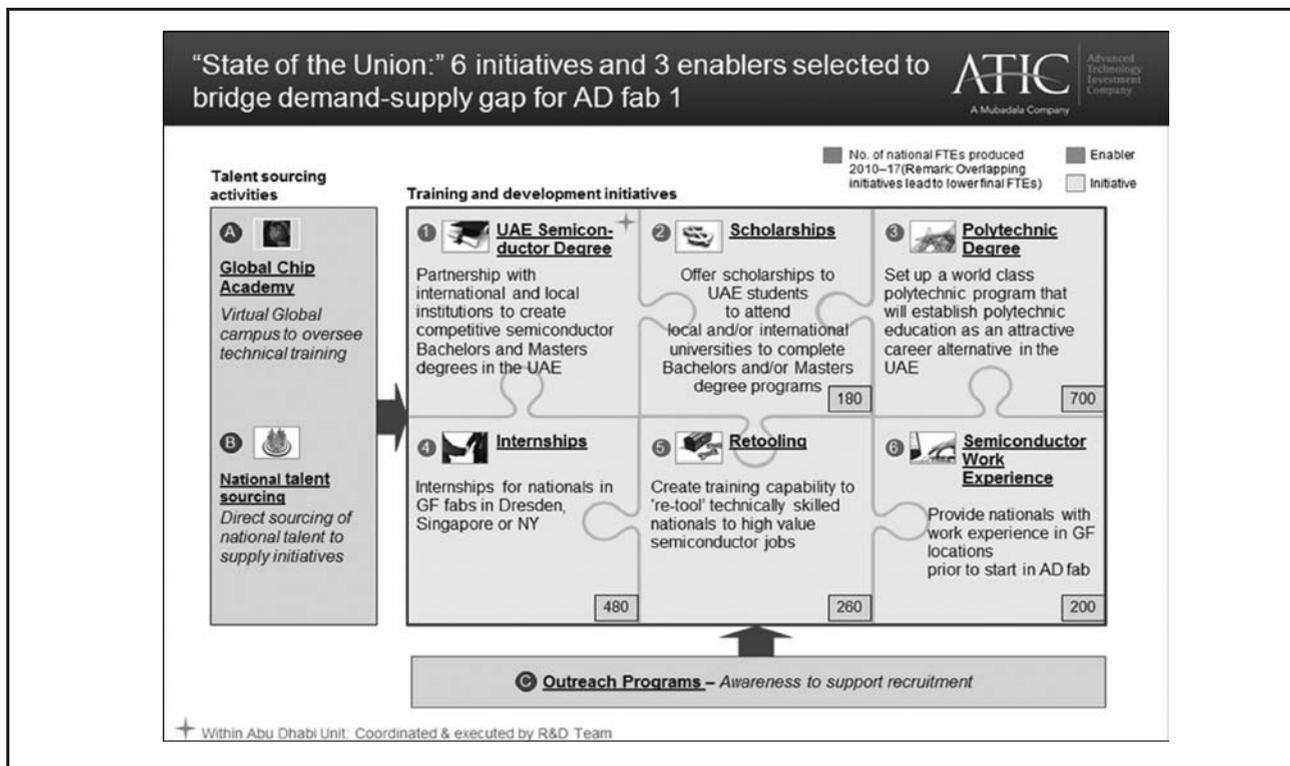
1.2.3 CORE ASSET 3: human capital

According to Sami to create a vibrant self-sustaining ecosystem during this current disruptive global economy, one would need a tremendous amount of investment in intangible assets. Human capital is one key intangible asset. Brigitte Sitzberger, the Associate Director of Human Capital at Abu Dhabi Ecosystem Development was responsible for the human capital initiatives at ATIC. She was responsible for developing the strategy to meet the human capital needs for GLOBALFOUNDRIES Fab 9 and worked in close collaboration with the Abu Dhabi GLOBALFOUNDRIES Human Resource Manager and the Worldwide GLOBALFOUNDRIES Vice President of Human Resources to ensure that the people they recruited fit the GLOBALFOUNDRIES standards and that the internships and internal placements did not overload the factories.

A future Abu Dhabi fab would have about 2,000 employees of which at least 50 per cent had to be Emiratis and 30 per cent should be female as per the ATIC mandate set by the Abu Dhabi Government. Planning for manpower six years in advance, Brigitte says, “It was simple mathematics, we looked at demand, we looked at supply – supply cannot meet the demand so we have to do something.” First, a fab of this size and technology would require some experienced professionals – there were no local semiconductor companies that could provide people of this expertise and competencies. Second, the current education system had no universities focusing on this field of specialization which meant it was unlikely that there would be any large pool of graduates from which to choose prospective employees. Historically, students did not do as well in science and mathematics and higher education often focused on management studies. Third, nationals formed only 20 per cent of the population and the current trend showed they favoured public sector jobs rather than private sector jobs.

Based on the past trends with previous GLOBALFOUNDRIES fabs, 28 per cent of its employed would be engineers and most of the rest would be Wafer Fab Technicians. Of the total workforce, 47 per cent could be non-experienced hires who have freshly graduated from an engineering degree program or a polytechnic. The plan was to have about 1,000 Emiratis ready for Fab 9 by 2015. In addition to this, 500 employees (250 Emiratis) would be needed in corporate functions but ATIC was sure that this would not be an issue. ATIC began to strategize about developing the technical human capital in 2009. They used a multi-prong method to develop local talent from the grass root level and contribute to its dual bottom line is shown in Figure 6. All scholarships were fully funded by the Abu Dhabi Education Council (ADEC).

Figure 6 State of the union



Initiative 1. UAE Semiconductor Degree: ATIC worked closely with established UAE Universities to create relevant semiconductor degrees and diplomas. They worked with ADEC to fund the scholarship of all nationals in degree and vocational programs (in the country and abroad). The first successful collaboration was in Fall 2010 with Massachusetts Institute of Technology and the MASDAR Institute of Science and Technology to launch the first Masters degree in Microsystems. The first batch had 12 students enrolled of which only two were Emiratis. As of 2011 Q2, the enrolment numbers were increasing. This was a long-term venture that would partner with local and international universities to bring in relevant Masters degree and enhance existing Bachelor degrees through introduction of semiconductor subjects. Two professorships were sponsored by ATIC to bring in top academic researchers to the UAE.

Initiative 2. AI Nokhba Scholarships: since they required 200 engineers, and the grass-root efforts at education were time consuming, ATIC provided scholarships to the brightest and best school students to study abroad in Ivy League and Tier 1 universities. In 2010, they had 42 successful candidates (25 per cent were female) of which 95 per cent got accepted in the best universities in the USA. The students could choose where they wanted to study from the list of pre-approved universities that work closely with AMD and GLOBALFOUNDRIES. In 2011, they had 41 students of which three were for Masters programs. ATIC had to educate parents as they were initially very wary of sending their children abroad to study by themselves in a co-ed environment. ATIC gave career guidance to every student. ATIC always invited parents to the information sessions, showing the parents that they cared as an organization about their potential employees. Each student had a mentor from GLOBALFOUNDRIES. ATIC created an Emirati buddy program for each student to be guided and supported by AI Nokhba seniors from the previous group of students. Females were allowed to travel home more often. In some cases, if required, parents could also visit their children abroad on the campus. ATIC had built a great reputation within the community. One of the parents said “I know if it’s ATIC, my kids are in good hands”.

Initiative 3. Polytechnics: in Germany, polytechnics are used to feed employees into the semiconductor industry. The UAE did not have a strong culture of vocational training and ATIC needed to help create it for its needs. ATIC decided to collaborate with the Institute of Applied Technology (IAT) to start a polytechnic program that would train high-school graduates in applied microelectronics; such training would enable students to work as Wafer Fab Technicians in the semiconductor industry. Considering that the word “technician” has connotations of low-end mechanical work in the UAE, the job title was rebranded as Wafer Fab Technologists to refer to the highly skilled nature of the work. This degree, now formally called Higher Diploma in Semiconductor Technology (HDST) was launched in September 2011.

The HDST is a three-year accredited degree fully run by IAT. The entire course is derived from learning outcomes required from Wafer Fab Technicians as defined by GLOBALFOUNDRIES. To ensure students get all the necessary practical training, they spend 25 per cent of their course in a training clean room using semiconductor tools. On top of that, they spend their last six months in an on-the-job training at an actual GLOBALFOUNDRIES fab so they are fully trained by the time they start as employees.

To get students interested in the program they had a massive media campaign using a combination of radio ads, e-mails, text messages, school posters, phone calls, newspaper ads and information sessions as shown in Figure 7. The messages spoke about the transformative nature of the industry, installed a feeling of pride about participating in the industry and then encouraged students to be part of the change. It was expected that this strategy would eventually produce at least 450 graduates by 2015. ATIC had factored in a 17 per cent drop-out rate keeping in mind current Emirati student trends. This program was free for nationals and each student earned a stipend during the program.

Initiative 4. Internships: this was a six-week internship program at GLOBALFOUNDRIES. The search for candidates began in August 2010. ATIC looked for students in the Bachelors program in the science track close to graduation. The first batch in 2009 had 20 students sent to Dresden. In December 2010, 60 students (50 per cent Female) were selected and sent to Dresden. In 2011, the third batch, had 55 students sent to Dresden and Singapore. Of the six weeks, the last two weeks included on the job training. Besides the in-depth training in the

Figure 7 Media promotion for HDST

I CAN CHANGE TOMORROW

I DEFINE WHAT COMES NEXT

STOP TRYING TO KEEP UP WITH THE NEW TECHNOLOGY. CREATE IT.

Shape the future and email at www.atic.ae
For more information please call 02 41 33553

ATIC | IAT | GLOBALFOUNDRIES

Notes: Was done in English and Arabic

classrooms and mock-up clean rooms, students were also immersed in an inter-cultural environment where they learnt about their host culture and educated their hosts about their Emirati culture. The idea was to give the students exposure to the industry, gauge their comfort levels with the bunny suits worn in the clean rooms and help them decide if the factory life is what they wanted to pursue. Conditional contracts were issued to the top performers to pursue the International Work Assignment (IWA) track upon graduation. Five interns (four are women) had become fulltime employees working for Dresden, GLOBALFOUNDRIES. Once Fab 9 was completed; they would make the transition back to Abu Dhabi. This opportunity became a great marketing tool whether the students pursued more avenues in this sector.

Initiative 5. IWA: the candidates recruited for IWA would be hired by GLOBALFOUNDRIES Abu Dhabi and sent abroad to Singapore or Germany for a two-three-year assignment to gain fab experience. Participants would return to Abu Dhabi during Fab 9 start-up phase. Based on their individual competencies and developmental needs, they would be assigned relevant positions. Typically candidates were experienced Emirati engineers/professionals from the labour force who had relevant technical competences, language skills, international mobility and motivation. 27 FTEs were selected for the pilot program in 2011: five were sent to Dresden, and the rest to Singapore. ATIC targeted 800 Emiratis in the initial recruitment stages before using the three-stage process to get 40 FTEs. Taaheed[3] is actively involved in the initial stages of recruitment. ATIC and GLOBALFOUNDRIES will take over in stage two and three and matches candidates with job opportunities. GLOBALFOUNDRIES was responsible for final employment and worked with each FTE to come up with an individual development plan.

Initiative 6. Retooling: ATIC had worked with several partners for this program. For recruitment, ATIC had worked with Tawteen Council[4] and Tanmia[5]. The prospective candidates are Emirati technicians with limited (one to five years) experience from labour force, with a minimum 12 Grade high-school certificate (science/technical), English language competency, international mobility and motivation. About 800 applications were screened, 41 FTEs had signed on. These FTEs were offered Traineeship by GLOBALFOUNDRIES. They would undergo preparatory training in Mathematics, English and Science by UAE Academy in Abu Dhabi for six month; a one-year training program in Singapore Polytechnic, one of the oldest polytechnics in the semiconductor industry in Singapore followed by a one year assignment in GLOBALFOUNDRIES. Students would then return to Abu Dhabi during ramp-up phase planned for 2015. Additional preparatory training would be provided depending on participant competence level. All FTEs were paid a progressive stipend during different phases of the training program and given relocation and immigration support during this time.

Initiative 7. Outreach: the objective was to create awareness, interest and get students to think about a job in the advanced technology sector. Three key programs were introduced in 2010. The first, a semiconductor university focused on Grade 11-12 students and their teachers. 50 Emirati students, 20 Emirati Teachers and 48 parents were involved in a four-day international program where all of them were flown to Singapore over the UAE National Day holidays. There were three separate programs: for the students, the teacher and the parents. From this initiative, ten students joined Al Nokhba scholarship. In 2010 at the American University, if Sharjah a two week boot camp focusing on microelectronics was held in the summer for Grade 11-12 students. Of the 20 students who participated, there was 50 per cent female participation. Three students joined the Al Nokhba scholarship. In 2011 multiple camps for Grade 8-9; Grade 10-12 and Grade 12 were organized and over 150 students participated. The Future Scientist Program, 2010, a four-week program, had 20 Emirati students belonging to Grade 8-10 (50 per cent female participation). Of these, three students joined Semi High Tech University Program. By 2010, all these initiatives funneled 92 Emirati potential employees in the human capital pipeline. The 2011 expectation for the outreach programs was for that number to increase to 150 new Emirati students. The 2011 program was revamped based on feedback and became more intensive as shown in Figure 8.

All these programs were supported by enablers. The Global Chip Academy was a long-term project which would take the form of a virtual corporate university sitting within GLOBALFOUNDRIES. The academy would manage all the learning and development and

Figure 8 Outreach programs in 2011

OUTREACH PROGRAMS
Highlight of outreach programs in 2011

ATIC
Advanced Technology Investment Company
A Mubadala Company

Outreach programs will yield approximately 150 new Emirati students in pipeline by end of 2011

Summer of Semiconductors	Alumni Re-engagement
<ul style="list-style-type: none">• 3-week program: July 10 – 28• 4 programs running in parallel:<ul style="list-style-type: none">• Future Scientist Program• Future Technologist Program• Microelectronics Boot Camp• Robotics Program (WRO Team)• 150 students from Grades 9 – 12• 10 teachers to participate in AMD Changing the Game Program as facilitators & administrators• <u>Program Providers</u><ul style="list-style-type: none">• AMD Foundation• Creative Kids Academy• American University of Sharjah• Abu Dhabi Education Council (ADEC)	<ul style="list-style-type: none">• Hosted alumni event in May with additional re-engagement events to follow throughout the year• Alumni:<ul style="list-style-type: none">• Outreach program participants• (students and teachers)• Interns from Al Nokhba Internship• Participants in Retooling Program• Distant alumni – Al Nokhba Scholarship and International Work Assignment participants

international movement within GLOBALFOUNDRIES retaining tacit knowledge, overseeing technical knowledge and leadership training and helping to integrate all the multiple cultures.

The second enabler was the National Talent Sourcing. This was a database of applications and referrals which would be leveraged in the future as the need arises. ATIC had worked with embassies abroad to let existing Emirati students know about the opportunities available in this sector. An Alumni network was established and any participant (whether successful or not) was part of this association. This allowed ATIC to track talent, engage them, work with them and if necessary develop them further.

The third enabler was awareness. The focus of one part of the communication strategy for human capital development was to make the people in UAE (especially Emiratis) aware of:

- what an advanced technology ecosystem in semiconductors was about;
- what initiatives they could participate in; and
- what career prospects were available for them especially in the private sector.

1.3. ATIC: writing the future

Success would not only be defined by the introduction of physical infrastructure in Abu Dhabi, but by creating an advanced technology community and a change in mind-set. This meant an ecosystem where individuals could experiment, fail and succeed eventually. The biggest challenge according to Ibrahim is “How could ATIC play a role in positioning the UAE, particularly Abu Dhabi in the Middle East as a strong contender for technology innovation and high technology manufacturing.” For ATIC, success would come by appreciation in its asset value. This meant building GLOBALFOUNDRIES to succeed in a market that has booms and bursts. Planning a strategy to win was vital for success and ATIC needed to anticipate potential roadblocks and opportunities in advance.

Keywords:
Emiratisation,
Dual bottom-line,
Destination policy making,
Strategic development,
Ecosystem-perspective,
Human capital,
Human resource
management

Notes

1. Abu Dhabi 2030 Economic Vision, available at: http://mubadala.ae/images/uploads/Abu_Dhabi_Economic_Vision_2030.pdf
2. UNESCO Science Report 2010.
3. Taaheed is a specialist MENA recruitment solutions company.
4. Tawteen Council is an initiative designed to empower young Emirati men and women. It works with all facets of UAE society to help young Nationals unlock their potential in order to pursue meaningful private sector employment.
5. Tanmia is also known as National Human Resource Development and Employment Authority focuses on the UAE National to increase their competitiveness locally and internationally.

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