

TAIWAN'S "SILICON VALLEY"

HSINCHU SCIENCE PARK

IRVING T. HO, Ph. D.

CHAIRMAN, EIC CORP.

45738 NORTHPORT LOOP WEST

FREMONT, CA 94538

THE TRANSFORMATION OF R & D IN EAST ASIA AND
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SCHOOL OF ENGINEERING, STANFORD UNIVERSITY

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TAIWAN'S "SILICON VALLEY"

HSINCHU SCIENCE PARK

1. INTRODUCTION
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4. PROBLEMS AND SOLUTION
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6. EFFECT OF HSINCHU PARK TO TAIWAN ECONOMY
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TAIWAN'S "SILICON VALLEY"

HSINCHU SCIENCE PARK

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INTRODUCTION:
(TO LEARN FROM SILICON
VALLEY)

SUCCESSFUL STORY OF SILICON VALLEY

- EFFECT ON CALIFORNIA ECONOMY, FROM A REGIONAL AGRICULTURE - BASED ECONOMY TO BECOME THE WORLDWIDE SEVENTH LARGEST ECONOMY*
- HI-TECH PANTHEON OF THE WORLD (SAN JOSE BECAME NO. 1 EXPORT CITY IN U. S. IN 1997)
- THIRTY-SEVEN PERCENTS OF U. S. HI-TECH MARKET VALUE (\$452 BILLION)**

* QUOTED CALIFORNIA FORMER GOVERNOR, PETE WILSON

** THIS AMOUNT WAS FOUR TIMES OF THAT OF U. S. AUTO INDUSTRY IN DETROIT, BUSINESSWEEK, AUGUST 18 - 25, 1997

KEY SUCCESSFUL FACTORS IN SILICON VALLEY

- A CHAMPION IN STANFORD'S DEAN TERMAN TO LURE BACK HIGH-TECH TELANTS
- STRONG COLLABORATIVE TIES BETWEEN UNIVERSITIES AND LOCAL INDUSTRIES
- A "REGIONAL NETWORK - BASED INDUSTRIAL SYSTEM THAT PROMOTE COLLECTIVE LEARNING" *

* ANNALEE SAXENIEN'S BOOK, "REGIONAL ADVANTAGE" 1994

IDEAL ENVIRONMENT FOR HIGH-TECH ENTREPRENEURS

- VENTURE CAPITAL
- TOLERANCE OF FAILURE
- CULTURE OF "COOPETITION"
- CLUSTER EFFECT

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SCIENCE PARK VS.
INDUSTIAL PARK

PARADIGM SHIFT TO KNOWLEDGE ECONOMY

“ (SILICON) MICROCHIPS FINDS THEIR VALUE NOT IN THEIR SUBSTANCE BUT IN THEIR INTELLECTUAL CONTENT. BY OVERCOMING THE CONSTRAINTS OF MATERIAL RESOURCES, THE MICROCHIP DEVALUATED MOST LARGE ACCUMULATION OF PHYSICAL CAPITAL “

GEORGE GILDER'S BOOK "MICROCOSM - THE QUANTUM REVOLUTION IN ECONOMICS AND TECHNOLOGY" 1989

PARADIGM SHIFT TO KNOWLEDGE ECONOMY

“WITH EVERYTHING ELSE DROPPING
OUT OF THE COMPETITIVENESS
EQUATION, KNOWLEDGE HAS
BECOME THE ONLY SOURCE OF
LONG - RUN SUSTAINABLE
COMPETITIVE ADVANTAGE”

LESTER THUROW'S BOOK, "THE FUTURE OF CAPITALISM",
1996

SCIENCE PARK vs. INDUSTRIAL PARK

	SCIENCE PARK	INDUSTRIAL PARK
CLIENTS	HI-TECH FIRMS WITH R&D CAPABILITY	MANUFACTURING
MANPOWER	TECHNICAL MANPOWER	LOW WAGE LABOR
PRODUCTS	NEW, INNOVATIVE PRODUCTS	MATURED PRODUCTS
PRODUCT CYCLE	COMPLETE PRODUCT CYCLE	MANUFACTURING ONLY

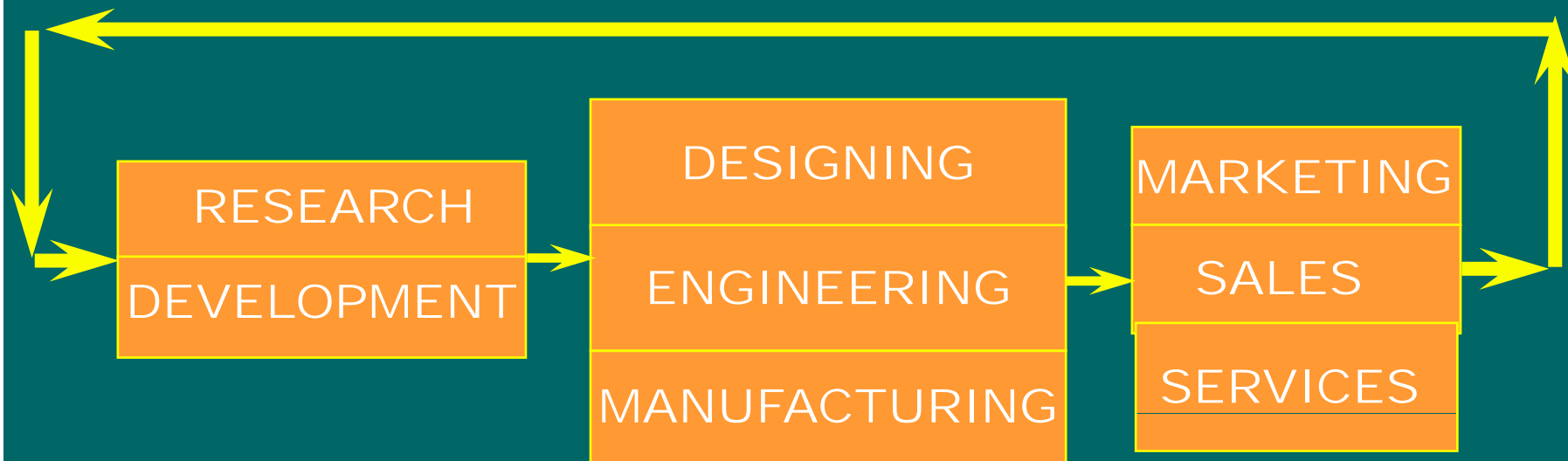
SCIENCE PARK vs. INDUSTRIAL PARK

INDUSTRIAL PARK - MANUFACTURING



SCIENCE PARK vs. INDUSTRIAL PARK

SCIENCE PARK - COMPLETE PRODUCT CYCLE



SCIENCE PARK vs. INDUSTRIAL PARK

- SCIENCE PARK CLIENTS;
WITH INNOVATIVE ABILITY TO
SELF-SUSTAIN THEIR GROWTH
AND CONTROL THEIR OWN
DESTINY
- INDUSTRIAL PARK CLIENTS;
LACK OF R&D RESOURCE AND
INNOVATIVE ABILITY, RELYING
MOSTLY ON MATURED TECH-
NOLOGIES

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GOAL, STRATEGY, PLANNING
AND EXECUTION

STATUS OF TAIWAN INDUSTRY IN LATE '70s

- TAIWAN'S INDUSTRIAL PARKS - EXPORT PROCESSING ZONES (SINCE 1965) - GRADUALLY RAN OUT OF ITS COMPETITIVE ADVANTAGE IN LOW COST MANUFACTURING DUE TO RAPIDLY RISING WAGE.
- FOREIGN INVESTMENT IN EPZS SLOWED DOWN AND SOME OF THEM MOVED GRADUALLY TO NEIGHBORING SE ASIA COUNTRIES
- STAGNATION OF ECONOMIC GROWTH IN TAIWAN

GOAL AND STRATEGY OF HSINCHU PARK

- GOALS;
TO HELP IMPROVE TAIWAN ECONOMY,
TO ESTABLISH TAIWAN INDIGENEOUS
HIGH-TECH INDUSTRY BASE,

TAIWAN GOVERNMENT OFFICIALS
RECEIVED VALUABLE ADVICE FROM
STNAFORD'S DEAN TERMAN

GOAL AND STRATEGY OF HSINCHU PARK

- STRATEGIES;
 - TO CREATE SCIENCE PARK ENVIRONMENTS AS CLOSE TO SILICON VALLEY'S AS POSSIBLE,
 - TO LURE BACK SOME EXPATRIATE ENGINEERS, SCIENTISTS AND OTHER HIGH-TECH PROFESSIONALS,
 - TO INCREASE UNIVERSITY ENGINEERING ENROLLMENT,

PARK ADMINISTRATION

- PLANNING

A TEN YEAR US\$500 MILLIOM, 500-HECTARE PARK DEVELOPMENT PLAN,

- EXECUTION

BIULDING INFRASTRUCTURE,
SELECTING AND RECRUITING PARK
CLIENTS,
FACILITATING INVESTMENT
ENVIRONMENT,
FACILITATING LIVING ENVIRONMENT,
BUILDING BRIDGE BETWEEN
UNIVERSITIES, R & D INSTITUTES AND
PARK CLIENTS,

INVESTMENT ENVIRONMENT IN HSINCHU PARK

- ABUNDANT SUPPLY OF ENGINEERING GRADUATES & SKILLED WORKERS
- FIVE YEAR TAX HOLIDAY
- UNIVERSITY COOPERATION PROGRAM
- RENTAL OFFICE AND FACTORY BUILDINGS
- R & D GRANTS
- CUSTOM SERVICE / WAREHOUSING
- OPERATOR TRAINING

LIVING ENVIRONMENT IN HSINCHU SCIENCE PARK

- PARK LIKE ENVIRONMENT
- RENTAL VILLAS, APARTMENTS AND CONDOS
- RECREATION / ENTERTAINMENT
- SHOPPING / RESTAURANTS
- MEDICAL CLINIC
- TRANSPORTATION
- BANKS / POST OFFICE
- ENVIRONMENT PROTECTION / SECURITIES

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PROBLEMS AND SOLUTIONS

HIGH-TECH HUMAN RESOURCE PROBLEM

- UNIVERSITIES _____

INCREASING ENGINEERING SCHOOL
ENROLLMENT (MOE),
MAJOR R & D PROJECTS IN FOUR
NATIONAL UNIVERSITIES (NSC),
SETTING UP FOUR CENTERS OF
EXCELLENCE (NSC)
- INSTITUTES FOR R & D
INDUSTRIAL TECHNOLOGY RESEARCH
INSTITUTES (MOEA)

HIGH-TECH VENTURE FUND PROBLEM

- THERE WAS NO HIGH-TECH VENTURE FUND AVAILABLE TO ENTREPRENEURS IN TAIWAN BEFORE 1980
- EXECUTIVE YUAN (CABINET) SET UP A VENTURE FUND OF NT\$800 MILLION SPECIALLY FOR HSINCHU PARK CLIENTS,
- THIS FUND WAS MANAGED BY TAIWAN'S BANK OF COMMUNICATION (GOVERNMENT OWNED), PARK ADMINISTRATION HELPED HANDLE APPLICANT SCREENING

BUREAUCRATIC EFFICIENCY PROBLEM

- MANY GOVERNMENT AGENCIES DELEGATED POWER TO HSINCHU SCIENCE PARK ADMINISTRATION TO MAKE "ONE STOP OPERATION" POSSIBLE,
- SPECIAL COMMERCE AND TAX LAWS PASSED BY TAIWAN LEGISLATIVE YUAN (CONGRESS) FOR HSINCHU SCIENCE PARK OPERATION (TO BE TRANSPARENT TO PARK CLIENTS),

EXPATRIATE CHILDREN EDUCATION PROBLEM

- SPECIAL LAWS PASSED BY TAIWAN LEGISLATIVE YUAN (CONGRESS) TO ESTABLISH A UNIQUE SCHOOL INSIDE THE HSINCHU PARK WITH BILINGUAL EDUCATION,
- THIS SCHOOL WAS SPECIALLY FOUNDED FOR THE CHILDREN OF RETURNING EXPATRIATE ENGINEERS AND HIGH-TECH PROFESSIONALS
- THIS SCHOOL ACCOMMODATES CHILDREN FROM KINDERGARTEN TO TWELVE GRADE

LOCAL STOCK MARKET PROBLEM

- BEFORE HSINCHU PARK PROJECT, TAIWAN HAD ONLY ONE STOCK EXCHANGE MARKET,
- AFTER THE ESTABLISHMENT OF HSINCHU SCIENCE PARK, AN OVER-THE-COUNTER STOCK EXCHANGE MARKET, WHICH WAS SIMILIAR TO THE UNITED STATES' NASDAQ EXCHANGE WAS FOUNDED BY TAIWAN GOVERNMENT

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CURRENT STATUS OF
HSINCHU PARK

CURRENT STATUS OF HSINCHU PARK

- TOTAL 1998 ANNUAL REVENUES OF PARK CLIENTS, \$14 BILLION US DOLLARS
- RETURNING EXPATRIATE ENGINEERS AND PROFESSIONALS TO HSINCHU PARK, OVER 3000 PERSONS
- HSIP'S TOTAL EMPLOYMENT, 74,700 WITH OVER 11,000 WORKERS HOLDING M. S. OR Ph. D. DEGREES
- SEMICONDUCTOR INDUSTRY CAPABILITY - TSMC
- COMPUTER INDUSTRY CAPABILITY - ACER

HSIP ADMINISTRATION STATISTICS

JUNE/1999 HSINCHU PARK STATISTICS

INDUSTRIES	NO. OF FIRMS	JUNE SALES
INTEGRATED CIRCUITS	116	NT\$26.2BILLION
COMPUTERS AND PERIPHERALS	50	NT\$17.6BILLION
TELECOMMUNICATION	45	NT\$ 3.2 BILLION
OPTOELECTRONICS	45	NT\$ 4.0 BILLION
OTHERS	28	NT\$ 0.5 BILLION
TOTAL	284	NT\$51.6 B (US\$ 1.6B)

MEDIA REVIEW OF HSINCHU PARK

"HSINCHU SCIENCE PARK (IS) PERHAPS THE CLOSEST ASIA HAS COME TO REPLICATING CALIFORNIA'S SILICON VALLEY. ITS 173 MOSTLY SMALL, NIMBLE ENTREPRENEURIAL COMPANIES GENERATED \$5 BILLION IN SALES IN THE FIRST HALF OF 1995, PRIMARILY IN INTEGRATED CIRCUITS, PCs AND PERIPHERALS. - - - THE HSINCHU PARK IS TOP - HEAVY WITH RETURNEES, MANY FROM SILICON VALLEY."

THE WALL STREET JOURNAL, OCTOBER 24, 1995

MEDIA REVIEW OF HSINCHU PARK

- "TAIWAN REINVENTS SILICON VALLEY"
- "TAIWAN'S HSINCHU SCIENCE PARK: THE LOCAL VERSION OF SILICON VALLEY HELPED TO REVERSE THE BRAIN DRAIN"
- "TAIWAN'S REACH: QUICK, NIMBLE COMPANIES HAVE GRABBED A COMMANDING GLOBAL SHARE OF MANY PC COMPONENTS"

* QUOTED FROM AN ARTICLE "SILICON VALLEY EAST",
FORBES MAGAZINE, JUNE 1, 1998 ISSUE

MEDIA REVIEW OF HSINCHU PARK

- "IT LOOKS LIKE A MINIATURE SILICON VALLEY, AND IT IS NO ACCIDENT",
- "BY ANY MEASURE, THE 1430-ACRE PARK HAS BEEN A ROARING SUCCESS THAT TRANSFORM TAIWAN INTO A HIGH-TECH POWERHOUSE",

QUOTED FROM A THREE-PAGE ARTICLE "SILICON VALLEY FAR EAST", BY SAN JOSE MERCURY NEWS STAFF WRITER, SARAH LUBMAN, SEPTEMBER 19, 1999

AN EXPERT OF SILICON VALLEY'S VIEW

- Q & A WITH PROF. A. SAXENIAN BY SAN JOSE MERCURY NEWS REPORTER*
- Q. BESIDES SILICON VALLEY, ARE THERE OTHER REGIONS OF THE WORLD THAT HAVE YOUR ATTENTION?
- A. I THINK IN TAIWAN, THE HSINCHU AREA IS A VERY INTERESTING REGION. PEOPLE ALWAYS ASK ME WHERE THE NEXT SILICON VALLEY. IS IT AUSTIN? IS IT CAMBRIDGE, ENGLAND? AND I SAY, "IF YOU LOOK ANYWHERE YOU SHOULD LOOK AT TAIWAN"

*MIRANDA EWELL, SAN JOSE MERCURY NEWS, SEPT. 29, 1997; A. SAXENIAN, AUTHOR OF REGIONAL ADVANTAGE, 1994, HARVARD UNIVERSITY PRESS

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EFFECT OF HSINCHU PARK TO TAIWAN ECONOMY

EFFECT OF HSINCHU PARK TO TAIWAN ECONOMY

- " TAIWAN, ALMOST ALONE IN ASIA,
REMAINS ECONOMICALLY HEALTH.
THE LITTLE ISLAND HAS MUCH TO
TEACH JAPAN AND KOREA "

QUOTED FROM AN ARTICLE "SILICON VALLEY EAST",
FORBES MAGAZINE, JUNE 1, 1998 ISSUE

EFFECT OF HSINCH PARK TO TAIWAN ECONOMY

- HSINCHU PARK INDUSTRIES HELP SUSTAIN TAIWAN'S HIGH-RATE ECONOMIC GROWTH, PER CAPITA GNP ROSE FROM \$1,920* IN 1979 TO \$13,198* IN 1997

TAIWAN GOV'T STATISTICS, ALSO ASIAWEEK,

6/27/1998

TAIWAN'S ECONOMIC ACHEIVEMENT

- IN THE CURRENT WORLDWIDE TOP 100 EMERGING-MARKET COMPANIES*, ASIA LEADS ALL OTHER GROUPS WITH 43 ENTRIES
- TAIWAN LEADS ASIA WITH 20
- AMONG TAIWAN'S ENTRIES ARE TSMC, UMC, WINBOND IN SEMICONDUCTORS AND ASUSTEK, QUANTA, ACER IN PCS AND PERIPHERIALS

* BUSINESSWEEK GLOBAL 1000, JULY 12, 1999

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CONCLUSION

REQUIREMENT OF GOV - ERNMENT COMMITMENT

- INITIAL INVESTMENT FOR HSINCHU PARK INFRASTRUCTURE INCLUDING AMENITIES
- VENTURE CAPITAL FUNDING FOR STARTUPS
- TAX HOLIDAY AND OTHER FINANCIAL INCENTIVES
- INDUSTRIAL LAWS AND REGULATIONS SIMPLIFICATION
- COOPERATION PROGRAMS AMONG UNIVERSITIES, RESEARCH INSTITUTES AND PARK CLIENTS
- DELEGATION OF POWER FROM SEVERAL OTHER GOVERNMENT AGENCIES TO PARK ADMINISTRATION FOR "ONE STOP OPERATION"

SUMMARY

- CHAMPION: HSIP RECEIVED VERY STRONG SUPPORT FROM TAIWAN GOVERNMENT
- STRONG EDUCATION TRAINING TO PROVIDE ABUNDANT SCIENCE / ENGINEERING GRADUATES AND SKILLED WORKERS
- RETURNING EXPATRIATE ENGINEERS
- ENTREPRENEURIAL SPIRIT
- RIDING THE TIDE OF PC REVOLUTION
- FOR HSIP TO SUSTAIN IT'S HIGH GROWTH, INCREASING R & D INVESTMENT BY PARK CLIENTS TO RIDE THE TIDE OF "INTERNET REVOLUTION" SHOULD BE EMPHASIZED

OTHER CONTRIBUTING INSTITUTIONS

- TSING-HWA UNIVERSITY
- CHAO-TUNG UNIVERSITY
- ITRI (INDUSTRIAL TECHNOLOGY AND RESEARCH INSTITUTE)
- VENTURE CAPITAL FIRMS
- OVER THE COUNTER STOCK MARKET

LOCAL CONTACT FOR HSINCHU SCIENCE PARK

DR. JEN-CHANG CHOU
DIRECTOR, SCIENCE DIVISION
TAIPEI ECONOMIC &
CULTURAL OFFICE IN
SAN FRANCISCO

5201
GREAT AMERICA PARKWAY SUITE
426 SANTA
CLARA, CA 95054

TEL:
FAX:
E-
MAIL: sdsf@ix.netcom.com