

# Formation of University-Industry Consortia: Experience of the Israeli Magnet Program & Implications for Ethiopia

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# Outline of the Presentation

- I. Research Questions
- II. Data Sources
- III. Israeli Innovation Networks
  - i. Reasons for I.N.: Domestic & International
  - ii. Fuels for I.N.: Political & Social facts
    - Government- Education & Human Resources - Industry
  - iii. Institutional Settings for I.N.
    - Domestic & International Frameworks
- IV. Case Study: Magnet (University-Industry-Consortia for Generic Technology Development)
- V. Conclusion: Policy Implications from Israel & Magnet

# I. Research Questions

1. What are the reasons behind the formation of innovation networks in Israel?
2. How do Israeli national & societal patterns affect the formation of innovation networks?
3. How nation specific institutions affect the formation of innovation networks?
4. What are the factors behind the formation of innovation networks successful in Israel i.e. in Magnet Program?
5. Can these factors be used as tools for DEVELOPING countries (i.e. Ethiopia) as to remedy their systemic failures?

## II. Data Sources

1. Central Bureau of Statistics of Israel
2. Israeli Private Consulting Company data
3. Results of the questionnaire & interviews among the participants of Magnet Program

# III. Case Study: Innovation Networks In Israel

- i. Domestic and International Factors
- ii. Political and Social Fuels
- iii. Organizational & Institutional Frameworks
- iv. Magnet Program (University-Industry-Consortia for Generic Technology Development)

# i. Domestic & International Factors

- French Amborgo of 1960s→
- Small country:→
- Small-scale and size industry and companies →
- Unfriendly environment→

## ii. Political & Social Fuels-1

### 1- Active Government Role:

- Decentralization & Co-ordination
- Office of Chief Scientist: Financial-Managerial Guidance support for Private R&D projects
- Mirroring the global developments
- Fostering country's venture capital
- Human Capital management
- Policy of Exports of high-value added goods
- 3,6 % of GDP allocated to R&D → top of the world (>\$ 673 / per capita)

## ii. Political & Social Fuels-2

### 2- Education & Human Capacity:

- **Reverse Learning:** Education has highest share in national budget
- **Largest scientists population:**
  - Immigration from the Ex-Soviet Union
  - Closure of Military Lavi Project
- Ratio of scientists: 140 per 10,000 workers
- 20 % of workforce has higher education (2nd after US)
- e.g leader in ICT employment

## ii. Political & Social Fuels-3

- **Entrepreneurship:** organizational skills+ risk taking culture
- **Innovativeness:** no other alternative
- **Networks:** Small compact society
- **Speed:** Efficient organizations
  - Culture of promptness & smaller organizations, lower bureaucracy, less complex programs → efficient system

## ii. Political & Social Fuels-4

### 3- Domestic Industry & Networks:

- **Industry center on:** ICTs- wireless technology- medicine- electro-optics-software-hardware design → \$15 billion in export revenues
- **Networks:** World's most successful high-tech clusters with the help of university system
  - 2nd & 3rd in Univ-Ind- cooperation
  - 2,000 High-tech Companies & 3,000 High-tech Start-ups
  - California's most likely rival: Silicon Wadi
- **ACHIVEMENT OF "CRITICAL MASS" OF SMALL POPULATION & LIMITED RESOURCES**

# iii. Organizational Frameworks

## ➤ Domestic Programs

- Pre-seed Programs
  - Technological Incubators
  - TNUFA → Individual Entrepreneurship
  - Noffar → Applied Academic Research
- Competitive Programs
  - Generic R&D
  - **Magnet**
  - Magneton

## ➤ International

- BIRD, CIIRDF,
- SIIRD, BRITEC,
- KORIL, EUREKO

## ➤ University- Industry Networks

- Science Parks
  - Kiryat Weizmann & Weizmann Institute
  - Matam & Technion
  - Malkah & Hebrew
  - Atidim & Tel-Aviv
- Industrial Parks - Zones
  - Tefen
  - Tel-Hai
  - Omer
  - Lavon
  - Matam

# MAGNET PROGRAM

## **MAGNET:**

### **Celebrating a decade of joint Industry -Academia research activities**

150 companies collaborate in joint R&D programs with academia

500 team research programs

Forming a consortium of companies and Academic units to achieve common vision by developing new technologies

Distribution and Implementation

An association of industrial companies to assimilate and expose generic developments

Learning from each others experience

**Magneton:** Joint Collaboration Between Industry and Academia to Encourage Technology Transfer

Program limited to 2 years, \$800K (3.6M NIS), 66% supported in industry, 100% in academia

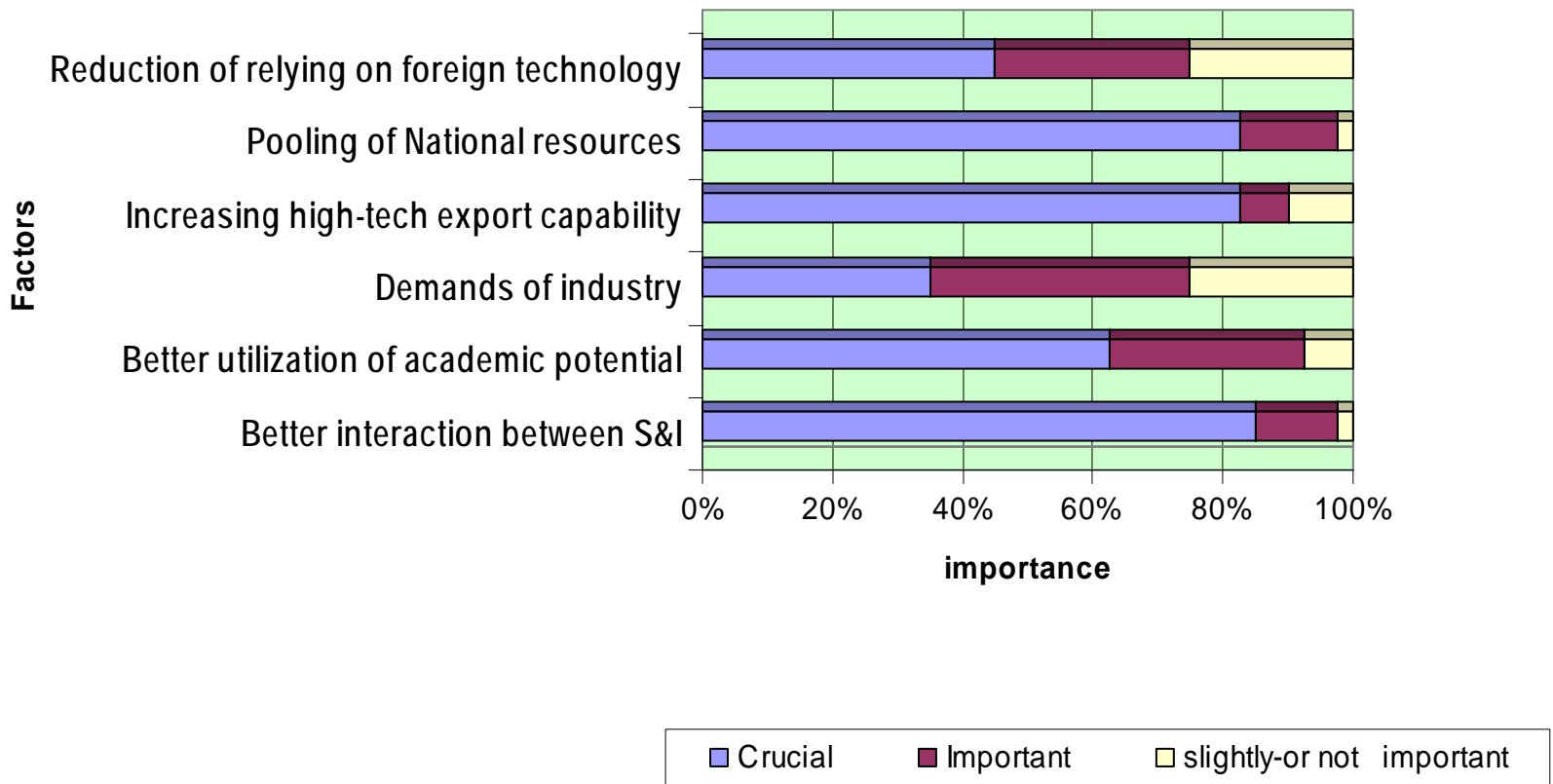
**Noffar:** Applied Research in the Academia Supported by Industry

One year program, \$100K (460K NIS), 90% support

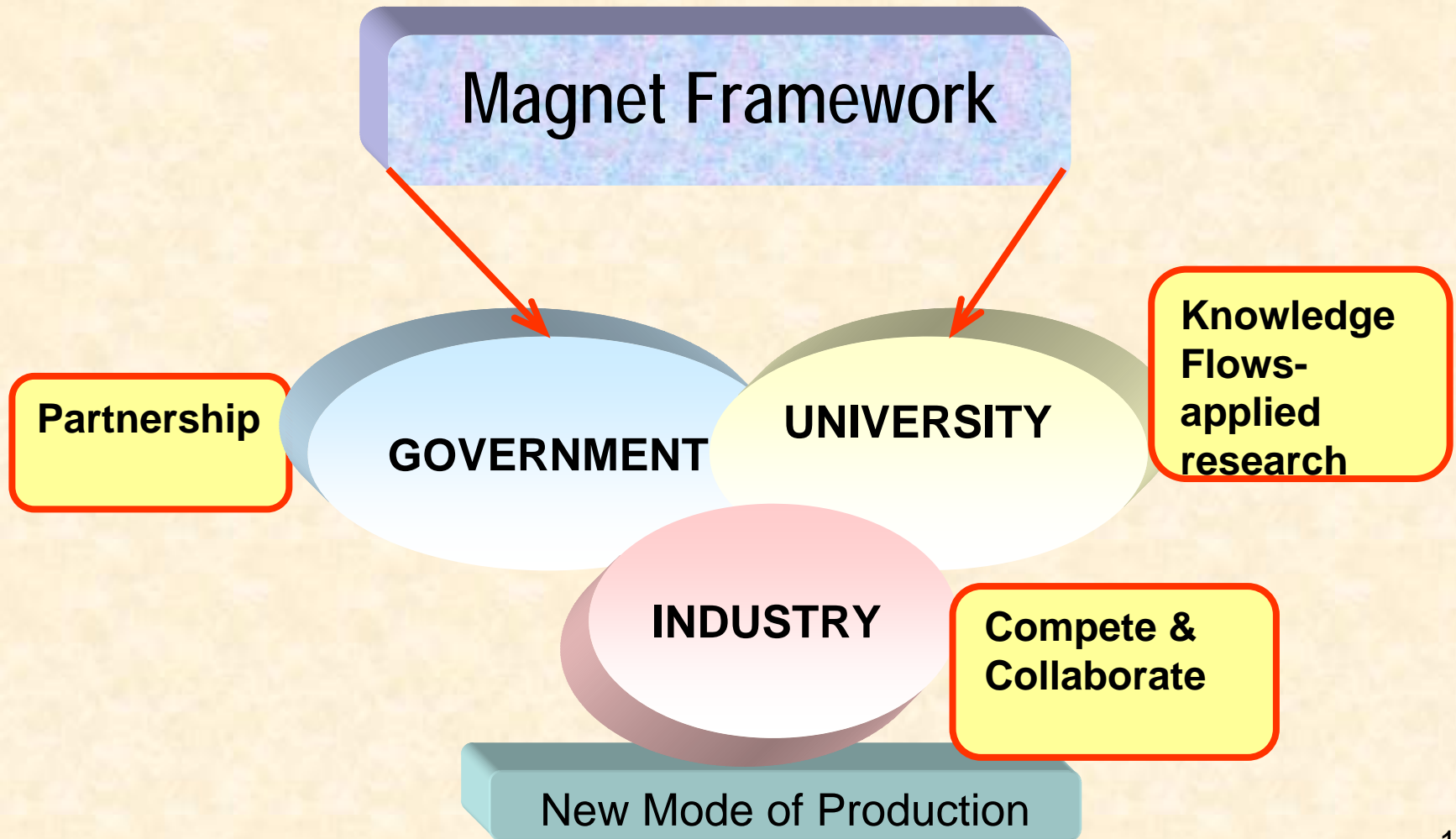
# IV. The Results of the Magnet Survey

- **40 individuals responded, of which**
- **28 are from industry: 55 %**
- **12 are from outside industry: 45 %**
- **where**
- **22 different companies**
- **8 different consortia**
- **3 different academic institutions participated**

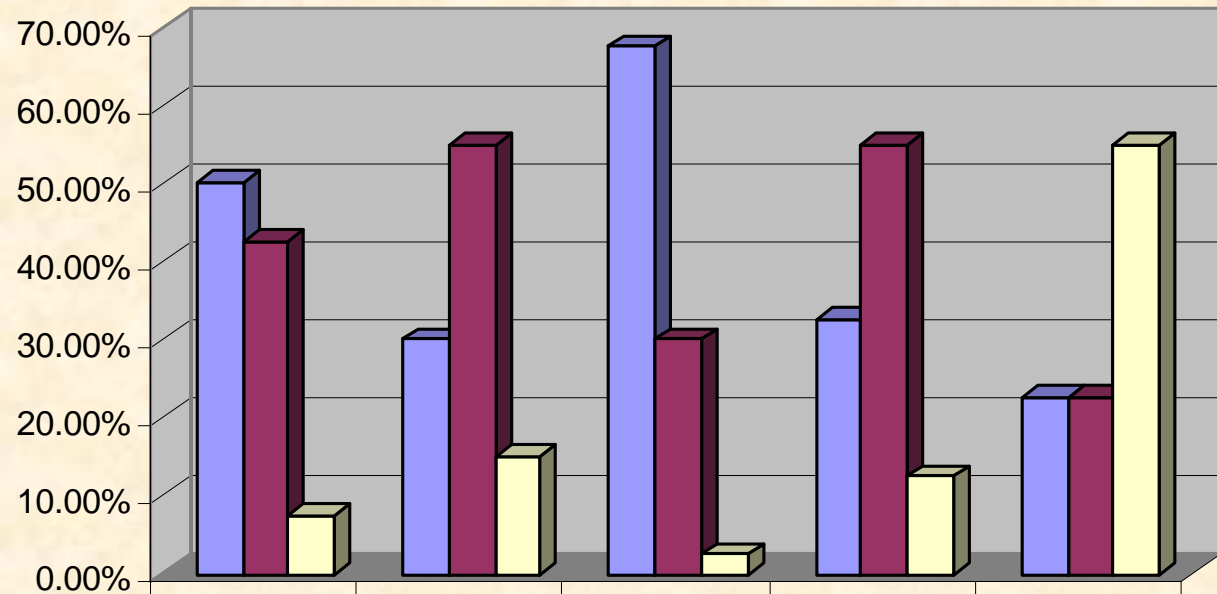
# i.Reasons for Magnet



# New Paradigm: Non-linear Innovation Networks

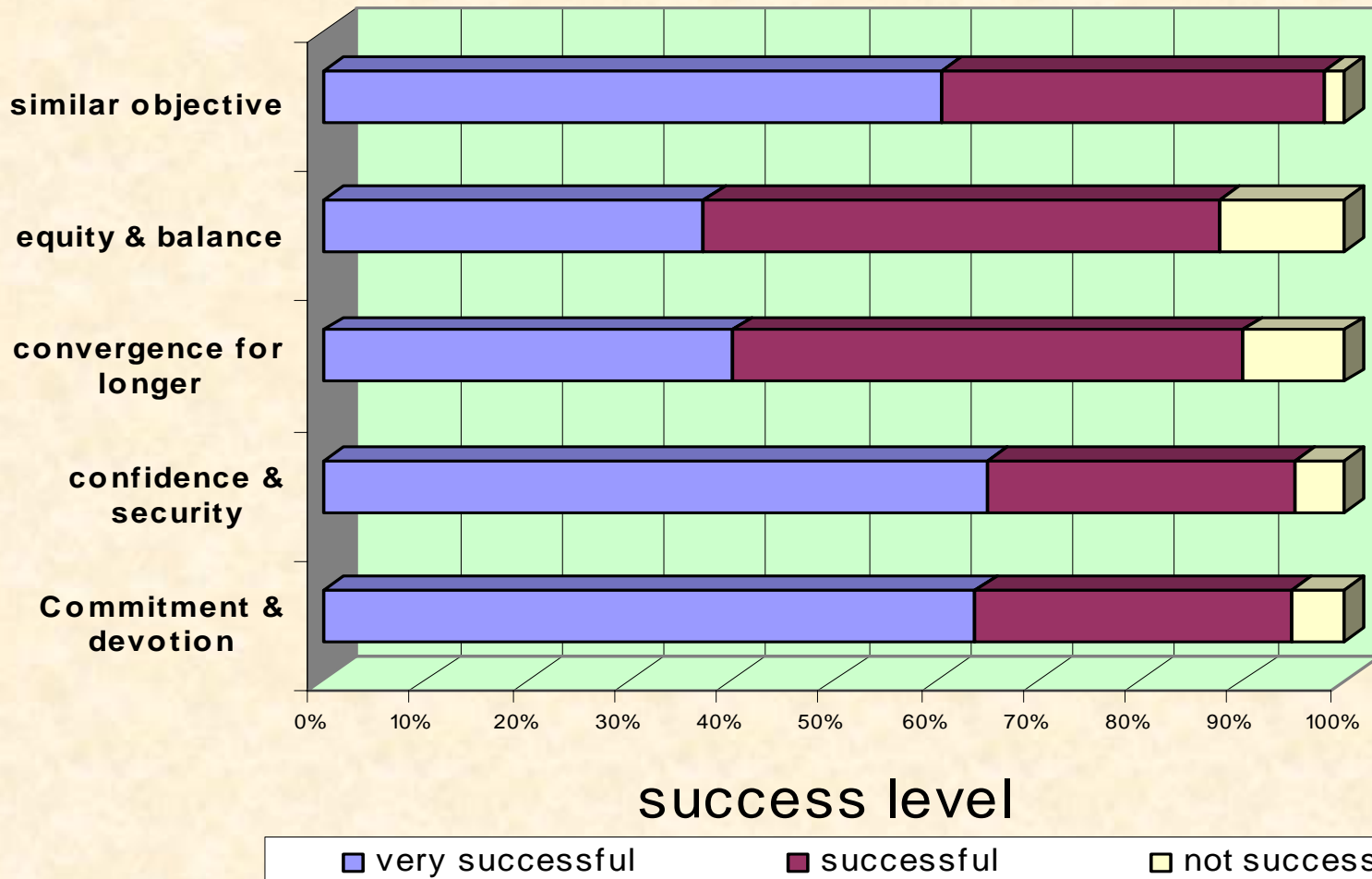


# Networking Relations in Magnet

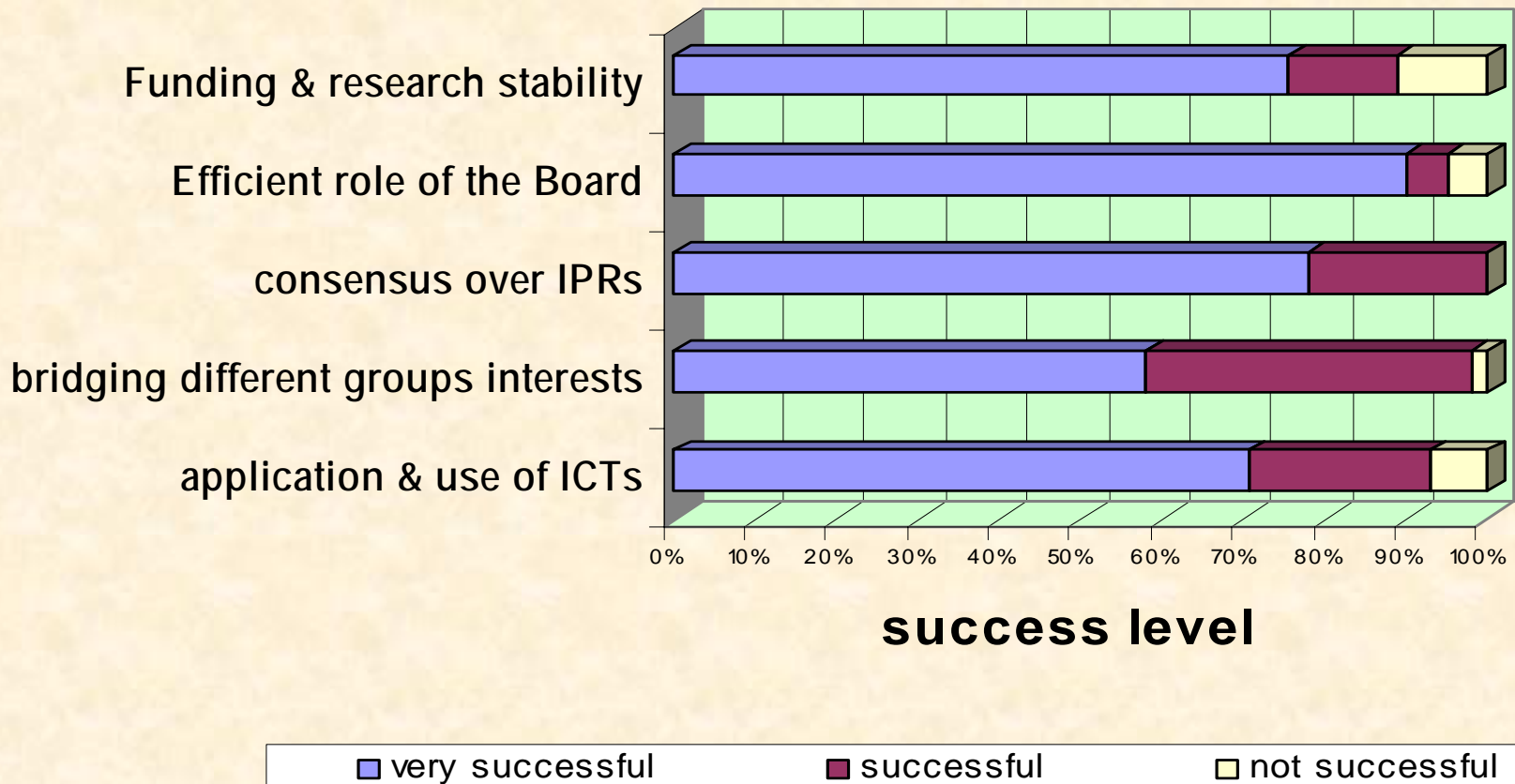


	government & Industry	government & university	university & Industry	Triple Interaction among	consortia & customers
Very Succ.	50.00%	30.00%	67.50%	32.50%	22.50%
successful	42.50%	55.00%	30.00%	55.00%	22.50%
slightly-or not succesful	7.50%	15.00%	2.50%	12.50%	55.00%

## ii. Societal Factors



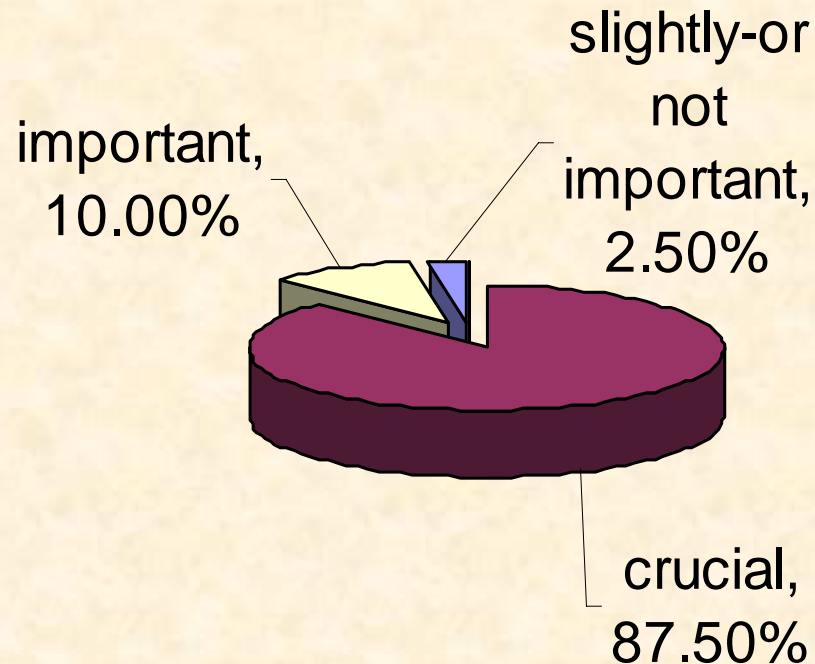
# Magnet Frame



# Impacts of the Magnet

1. Decreasing the risks time & costs for R&D & innovation → **Flexibility**
2. Optimization of R&D inputs → **Efficiency**
3. Transformation of individual learning → **Interactive learning & organizational knowledge**
4. Elimination of 'Strategic Gap' → **longer-term projects**
5. Achievement of SYNERGY → **Networks of actors provide more than the sum of the individual parts  $1+1+1>3$**

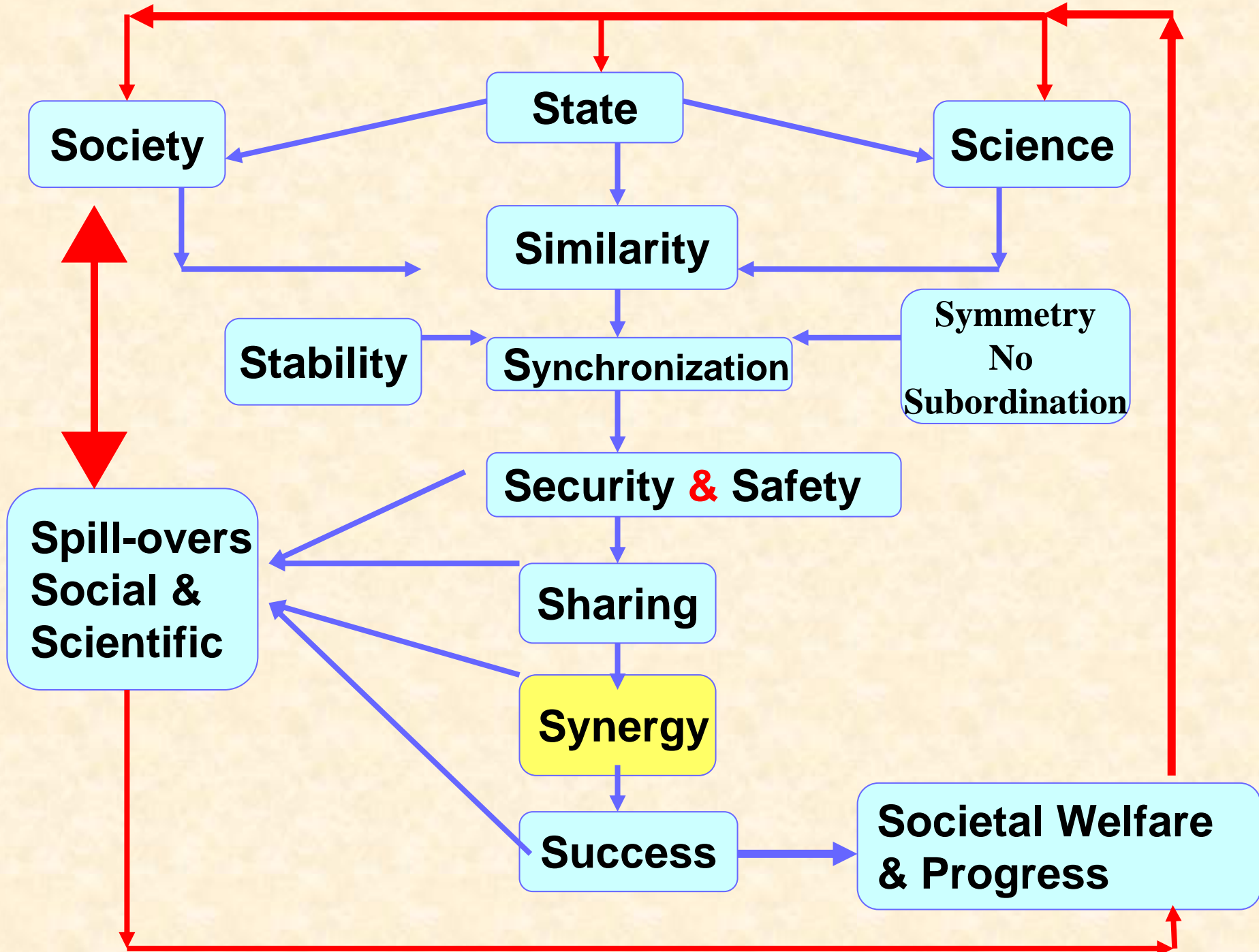
# Importance of Synergy in Magnet Frame



■ crucial ■ important ■ slightly-or not important

# Implications from the Israeli Experience

- Elements of Synergy Creation in I.N.
- &
- Determinants of Innovation Networks



# Determinants of Innovation Networks

- 1. Customized & Systematic Management:** Business Strategy + ICT+ Organizational Cultures+ Communication + Psychology
  - Consistant with National Systems of ...
  - Stability: Funding + Research +Long-term Relations
- 2. Multilateral Relations:** Common Trust+ Confidence + Similar Objectives + Full Commitment
  - Change in traditional institutional settings
  - Integration of sub-systems & actors
  - Equity-balance-commitment
- 3. Linking to international & global systems**
  - S&T innovation Programs
  - Global Markets
  - Educational & knowledge links

Characteristics of U-I consortia	Israel & Magnet	Situation in Developing C. (e.g. Ethiopia)
Government	Active	Non-participant/ political problems
Science & Technology Agents	Active & widespread	Lack of political & financial support
University	Basic, applied research Entrepreneurial activities are supported	Low-tech, lack of funds to upgrade university Lack of interest in industrial applications
Industry	Science-oriented/ (producer & user)	Low-tech
R&D Investments	3,5% GDP → R&D >\$650 R&D /capita	Low R&D Investments e.g.

Characteristics of U-I consortia	Israel & Magnet	Situation in developing C. (e.g. Ethiopia)
Strategy & Objectives	Socia-economic, global achievements	Unclear, unstabilities
Use of ICT	Widespread	Limited use & access
Cooperation	High-cooperation	Lack of personal & instutional interaction
Market need/Demand	High-tech demand & use	Low-income, low-tech demand
Evaluations	External auditing/ consultancy	Political ups-downs

# Lack of Institutional Coordination & Frameworks

Different Historical Experiences of most Developing Countries

- Mismatch Between Industry & Academy
- Lack of Networking Between Institutions & Individuals
  - Unfamiliarity with academic research & culture
  - Lack of mutual confidence & belief
  - Disbelief for long-range strategies
  - Sluggish bureaucratic structure

# Factors of Innovation Networks

## Appropriation of Networks in Developing Economies

- Achievement of full network conditions within UGI partnership programs
- System Function & Success = Creation of SYNERGY
- Factors of Synergy Creation:
  - Trust, stability, confidentiality
  - Symmetrical relations, equity & balance
  - Commitment & devotion of all participants
  - Convergence for longer-term relations

# Driving forces of International Cooperation

- Similar S-T & I structures based on Triple Helix Approach
- Establishment of trust & belief
- Potential markets
- Balance between High-tech & Traditional Technology Sectors

Thank you very much