MINUTES

HOUSE COMMITTEE ON ECONOMIC DEVELOPMENT

September 27-28, 1993
Room 526-S -- Statehouse

Members Present

Representative Bob Mead, Acting Chairperson
Representative Tom Bishop
Representative Garry Boston
Representative Les Donovan
Representative Gary Haulmark
Representative Jerry Henry
Representative Richard Lahti
Representative William G. Mason
Representative Gayle Mollenkamp
Representative Richard M. Nichols
Representative Greg A. Packer
Representative Carol Sader
Representative John M. Toplikar
Representative Jene Vickrey
Representative Jack Wempe

Members Absent

Representative George Dean
Representative Wanda Fuller
Representative Joel Rutledge
Representative Forrest Swall

Staff Present

Lynne Holt, Kansas Legislative Research Department
Bob Nugent, Revisor of Statutes Office
Ellie Luthye, Committee Secretary

Conferees

Professor Ted Kuwana, University of Kansas
Dave King, Chairman, Kansas Science and Technology Council
John Carlin, President, Midwest Superconductivity

Phil Anderson, President, Kantronics
Ralph Lagergren, President, Agri-Technology
Dr. Bill Brundage, President, Kansas Technology Enterprise Corporation
Clyde Engert, President, Innovation Technology Enterprise Corporation
Patrick Connelly, President, ICE Corporation
Commissioner Lee Droegemueller, Kansas Department of Education
Dr. John Poggio, School of Education, University of Kansas
Dr. Marilyn Kourilsky, Vice-President, Kauffman Foundation, Center for Entrepreneurial Leadership
Dr. Dorothy Soldan, Center of Economic Education, Kansas State University
Dr. John Staver, Center for Science Education, Kansas State University
Valerie Burke, Center for Business Innovation
Todd Lawrence, Baird, Kurtz and Dobson
Dr. Howard Mossberg, Vice-Chancellor for Research, Graduate Studies, and Public Service, University of Kansas

September 27, 1993
Morning Session

Chairman Bob Mead called the meeting to order at 10:00 a.m.

Dave King, Chairman of the Kansas Science and Technology Council, spoke to the Committee about the skill deficiencies of high school graduates in this country compared to skill competencies of their peers in other countries, such as Japan. He also noted that Kansas experiences an out-migration of its most talented students which is reflected in the scholastic pursuit of careers in science and technology.

According to Mr. King, in 1989, Kansas ranked 10th in the country in the number of students enrolled in postsecondary science and engineering, but only 44th in the country in the number of Ph.D scientists and engineers. Mr. King also emphasized that the number of patents is an indicator of a state's research activity. In 1990, Kansas reported 300 patents, which ranked it 31st in the United States; whereas, Colorado reported 798 patents, which ranked it 11th in the country.

Mr. King explained the purpose of the Experimental Program to Stimulate Competitive Research (EPSCoR) program, which is to make certain states capable of competing at the national average for federally funded research grants in science, engineering, and math. He informed the Committee that the Science and Technology Council was created as an oversight committee in compliance with federal grant requirements.

Mr. King observed that the Science and Technology Council was in the process of developing a strategy to identify the strengths and weaknesses that are attributable to the existing science and technology activities in the state so that it can be determined how the state should best proceed with its investments in those areas. Another observation was the lack of oversight of education in Kansas. To that end, Mr. King recommended the establishment of an oversight board to set goals for such coordination.

Professor Ted Kuwana, University of Kansas, made several comparisons of Kansas' ability to obtain federal research funds to that of other states, and provided information about reasons for the lack

of state competitiveness in this area. Dr. Kuwana explained the importance of having a dedicated pool of money to serve as a state match for federal EPSCoR grants and suggested the possibility of establishing some sort of future enhancement fund (Attachment 1).

Dr. Kuwana responded to questions from the Committee regarding the purchasing requirements for obtaining university research equipment, which was a barrier he listed in his presentation. He suggested that the Committee might refer to the procedures used by Ohio State University which, in his opinion, was a possible model for emulation.

The Committee adjourned for lunch at 12:00 noon.

Afternoon Session

John Carlin, former Governor and President of Midwest Superconductivity, commented on some of the obstacles encountered by businesses at key junctures in the commercialization process: (1) shortage of capital; (2) intellectual property hurdles; (3) regulatory compliance issues; and (4) cultural obstacles. Governor Carlin noted that the transition from research findings to the development of a commercializable product or process requires considerable time and capital, as well as patience and the willingness to take risks.

Phil Anderson, President of Kantronics, listed the three areas of excellence that are needed for technology-driven businesses: (1) applied research; (2) applications marketing; and (3) quality of product and service. A company must employ sales persons who know how to sell and have a good understanding of the product. Finally, resources must be directed in a concentrated manner to those areas in which small companies have developed marketable product niches and have demonstrated success (Attachment 2).

Ralph Lagergren, President, Agri-Technology, spoke next to the Committee. He showed a video regarding a product, the birotor combine, developed by his company. He also outlined the steps required to take the product from the design stage to the production stage. He stated that one of the barriers the company had encountered during the 13 years of development was a lack of information about available assistance programs.

Bill Brundage, President of KTEC, presented a report on the Innovation and Commercialization Network. He stated KTEC was in the final stages of its mission, having spent the first six years in developing infrastructure. KTEC was in the process of the second phase, which involved formalizing the program and ensuring the realization of a return on investments in the development of the infrastructure. He informed the Committee that, to date, KTEC had received $39 million of state moneys and it had leveraged approximately $142 million dollars of nonstate moneys. Dr. Brundage explained KTEC's proposal for an innovation and commercialization network and then discussed the funding, the structure of the network, the investment process, the technologies developed through KTEC programs, and the results obtained (Attachment 3).

The Committee viewed a video on incubators, developed by the Kauffman Foundation-Center for Entrepreneurial Leadership, which featured Dr. Jana B. Matthews, of the Center. In the video Dr. Matthews explained the differences between incubators and incubation and listed the ten best practices for managing and developing incubators. (A copy of testimony, as transcribed from video, is Attachment 4.)

Clyde C. Engert, President of Innovative Technology Enterprise Corporation (ITEC), stated that ITEC's mission was to assist innovators in the development and commercialization of marketable ideas in technology for Kansas. He told the Committee that taking a new technology to a commercializable stage was a difficult and complex process. He listed the five stages all technologies must go through to become successful: (1) concept development; (2) applied research; (3) start-up; (4) roll-out; and (5) working capital. He stated it was his belief the success rate of 2 percent for commercialization of inventions is not a valid basis for judging the commercialization potential for inventions. Rather, this percentage indicates the failure of traditional methods of inventor development and the need to find innovative ways to improve that percentage (Attachment 5).

Patrick Connelly, President, ICE Corporation, presented a report on strategies for marketing high tech products and the processes involved. He noted that Kansas has all of the necessary ingredients to commercialize such products, such as land, quality of life, a good work ethic, excellent high educational facilities, and a head start on other states with the proposed regional Innovation and Commercialization Centers. He explained that the ideal scenario would be the creation of centers that would provide assistance to inventors in mechanical technology, electrical technology, legal issues, and the business aspects of promoting their products for commercialization (Attachment 6).

Dr. Brundage concluded his presentation by presenting a list of nine recommendations for the Committee's consideration, and spoke briefly on each one (Attachment 7).

The meeting adjourned at 4:50 p.m.

September 28, 1993
Morning Session

Dr. Lee Droegemueller, Commissioner, Department of Education, informed the Committee that the Board of Education developed grade level benchmarks for determining the intended program outcomes. (See *The Curricular Standards for Society*, on file at the Kansas Legislative Research Department.) Dr. Droegemueller explained that the Board was in the process of developing science assessment tools for students in certain grades.

Dr. John Poggio, School of Education, University of Kansas, presented an overview of the assessment of students in mathematics, science, communications, and social studies at different grade levels, as mandated by the 1992 School Finance Act. He said the Science Assessment for the State of Kansas would be completed in the Spring of 1994. The first assessments are designed for grades 5, 8, and 11.

Dr. Poggio noted that the primary purpose of the assessment was to evaluate students and learn about their strengths and weaknesses with regard to the curriculum subject matter under consideration. The second purpose was to provide information to teachers on their students' skill proficiencies so that they can begin to adjust the teaching and learning practices to effectively realize those standards. The third purpose is accountability -- the information would be available to report to the State Board of Education, to local boards of education, to elected officials, as well as to parents regarding the progress of the student in the designated subject area (Attachment 8).

Dr. Brundage introduced Dr. Marilyn Kourilsky, Vice-President, Center for Entrepreneurial Leadership, the Kauffman Foundation. Dr. Kourilsky showed a video "Breaking Away," which expounded on a new learning concept. She described the Kinder-Economy program, which is designed for students in grades K-3 and is considered a proven method of closing the gap between economic illiteracy and the capacity to make well-informed economic decisions. Dr. Kourilsky noted that the program affords students the opportunity to make decisions and realize the consequences of their actions through exposure to basic economic concepts and practices, and that it assists students in applying what they learned in the classroom to decisions made in other settings (Attachment 9). Dr. Kourilsky distributed an article from *The Wall Street Journal* regarding the Kinder-Economy program (Attachment 10). Dr. Kourilsky followed this overview with an overview of the Mini-Society program, which is suitable for children in all elementary grades, but is best suited for grades 3-6. In this program, students experience developing and living in their own construct of society within their classroom. She explained that economic concepts are learned through these experiences and through the debriefing sessions in which concepts, problems, and decisions are later discussed and analyzed (Attachment 11).

The next conferee was Dr. Dorothy Soldan, Center for Economic Education, Kansas State University. Dr. Soldan distributed an annual report from the Kansas Council on Economic Education. (A copy is on file at the Kansas Legislative Research Department.) Dr. Soldan observed that the outcomes of an American education should include a basic understanding of the U.S. economy and an ability to engage in economic analysis. Both are necessary if U.S. students are to be prepared for responsible citizenship. According to Dr. Soldan, a study of economics should be included in: (1) the explicit definitions of our national educational goals; (2) national standards and assessments; and (3) federal, state, and local teacher training and curriculum development programs. Dr. Soldan concluded her remarks by noting that Kansas has no mandated education program in economics and one must integrate economics with other existing state and national goals and outcomes (Attachment 12).

Dr. John Staver, Center for Science Education, Kansas State University, spoke to the Committee about continuing education for science teachers of students in grades K-12. He stated that the Center was funded by the Margin of Excellence and that its purpose is to improve the instruction of science, mathematics, environmental science, and technology. Dr. Staver discussed the changes in the workplace which is now scientifically and technologically-driven, and which requires people to work in groups and have good communication and high thinking skills. To accomplish these goals there must be a partnership between school districts, colleges, universities, boards of education, commissioners of education, and teachers to revamp science teacher education. He concluded by saying that diversity is a strength and not a weakness, and that the important problems today cannot be solved by one person or one perspective.

Valerie Burke and Todd Lawrence made a joint presentation on the experiences of interns of the Center for Business Innovation (CBI), working with businesses. The Committee learned that CBI was awarded the 1993 Incubator-of-the-Year award, and that there are now 500 incubators in the country. The purpose of the Center is to offer a unique graduate internship program for regional students pursuing graduate degrees in business, law, or public administration. The Committee was informed that each student is given the opportunity to contribute to the incubator process by evaluating and selecting new CBI clients. Interns also work directly with CBI clients on management teams to make business decisions, as well as to resolve business problems that may arise. Participants learn to apply their classroom experiences to the business world. The intern program provides students with invaluable knowledge about, and experiences in, the entrepreneurial process. Interns receive a salary of $600 a month for up to ten months and three credit hours.

Dr. Howard Mossberg, Vice-Chancellor for Research, Graduate Studies, and Public Service at the University of Kansas, spoke about how universities bridge the gap between academia and business, and assist in the creation of businesses. Dr. Mossberg listed the policies of the University of Kansas governing intellectual property. He observed that the Regents patent policy encourages faculty, staff, and students to engage in professional activities, and acknowledged that if new knowledge is created of potential benefit to society, the best way to assimilate this knowledge is through commercial channels. This policy also ensures that the knowledge benefits those parties that originated it -- the university and the outside agencies that supported it. Dr. Mossberg also spoke about plans for three innovation centers in Johnson County, Wyandotte County, and Lawrence. According to Dr. Mossberg, the University of Kansas is committed to supporting basic research, applied research, and the establishment of an innovation center. Once the latter is created, Dr. Mossberg noted that it becomes the realm of the business community. (Attachment 13)

Afternoon Session

Chairman Bob Mead opened the floor for Committee discussion and recommendations.

Representative Haulmark made a motion to support No. 2 of the KTEC recommendations, which would support the seed capital investment fund for a total of up to $5 million and would require an additional $3.5 million investment in the Ad Astra Fund over the next two years. Representative Mason seconded and the motion carried.

Representative Haulmark made a motion to recommend to the Regents that students be required to complete a course on the principles of economics for two semesters as part of their university curriculum. This motion failed for lack of a second.

Representative Mason made a motion to endorse the concept of No. 1 of the KTEC recommendations. That recommendation would call for the Legislature and Governor, as well as the private sector, to support the Innovation/Commercialization Corporations. This was seconded by Representative Donovan. The motion carried.

Representative Sader made a motion to support Nos. 7 and 8 of the KTEC recommendations. Representative Haulmark seconded. Recommendation No. 7 would require the state to seriously consider the K-12 entrepreneurial curriculum being developed by the Kauffman Foundation. Recommendation No. 8 would call for continued funding of KTEC at its current level ($11 million) or slightly more, if possible.

Representative Wempe stated he had concerns recommending the concept of No. 7 on the basis of one presentation by one party. Representative Lahti recommended bringing Dr. Marilyn Kourilsky from the Kauffman Foundation back during the 1994 Session to appear at a joint meeting of the House Education and Economic Development committees, where there would be more time to ask questions regarding this program.

Representative Haulmark wanted the Committee report to show the $11 million funding for KTEC in Recommendation No. 8 would actually be increased to $13 million if Recommendation No. 2 were adopted.

Representative Toplikar offered a substitute motion which would adopt Recommendation No. 8 only, to continue funding KTEC at its current level of $11 million and more, if possible. Representative Wempe seconded. The motion failed.

Representative Henry made a recommendation that other programs should be studied concerning Recommendation No. 8, such as the curriculum offered through Kansas State University (the Kansas Council on Economic Education).

A vote was called for on the original motion to support Nos. 7 and 8 of the KTEC recommendation. Staff suggested the Committee might want to consider the broader perspective offered by Representative Henry for Recommendation No. 8 and Representative Sader concurred. The motion carried.

Representative Sader made a motion for the Economic Development Committee to express some support for use of EDIF funds in the area of community college and AVTS education. She explained this was a recommendation the Task Force on Community Colleges and AVTS's was coming out with soon. She felt it would add credibility if more than one group would endorse the concept without citing any specific amount, but noting only that EDIF funds should be used for vocational education and job training and re-training. Representative Henry seconded.

Representative Bishop asked if the Task Force report was out yet. If not, he raised the question as to whether it was premature to offer this recommendation before the report was made public and to endorse a concept that had not yet been finalized.

Representative Sader indicated the report had not yet been released and withdrew her motion, to be reconsidered after the Task Force report was presented. Representative Henry withdrew his second.

Representative Mason made a motion to adopt No. 5 of the KTEC recommendation, which supports the contingency fund that was passed during the 1993 Legislative Session. This fund authorized expenditures of $1.5 million from the requested $5 million proposed in the original bill. The staff asked if the Committee intended this fund to be established in enabling legislation, assuming that the Legislature would pass the bill. Alternatively, was the Committee recommending continued funding as a line item appropriation? Staff observed that the fund is presently only in an appropriations bill and does not have the effect of continuing after this fiscal year without additional authorization. The Committee concurred on enabling legislation.

Representative Mason indicated he wished his motion to follow the final version of Representative Heinemann's bill before it was vetoed. This motion was seconded by Representative Bishop and the motion carried.

Representative Toplikar recommended a study be considered similar to House Sub. for Senate Sub. for S.B. 334, which was vetoed, which would require some kind of assessment of basic skills proficiency, patterned somewhat after the Oregon legislation. He asked that this reconsideration of this legislation be made a part of the Committee report. Motion carried.

Representative Mead called the attention of the Committee to the report by Dr. Ted Kuwana regarding the procurement policy of the state. He asked Committee members if they would like mention of the Committee report, and if they would like staff to examine this policy and perhaps obtain information on the procurement policy of Ohio, to which Dr. Kuwana alluded in his presentation. The Committee concurred.

Representative Lahti asked that his recommendation of a joint meeting of the House Education and Economic Development committees, to listen again to a presentation by Dr. Marilyn Kourilsky on her entrepreneurship program, be made a part of the report. Representative Bishop suggested the Committee consider other similar programs.

Representative Sader suggested that this recommendation and information related to these economic literacy programs be imparted to the State Board of Education for its review and response.

The meeting adjourned at 3:15 p.m.

Prepared by Lynne Holt

Approved by Committee on:

January 10, 1994
(date)

GUEST LIST

COMMITTEE: Economic Development DATE: 9/27/93

NAME (PLEASE PRINT)	ADDRESS	COMPANY/ORGANIZATION
MERLE HILL	TOPEKA	KACC
SCOTT FEEKEN	TOPEKA	GOVERNOR'S OFFICE
Jim McKenzie	Topeka	Observer
DAVE KIRK	OP	KS S&T COUNCIL
Bill Thompson	Topeka	KDOCH
Charles Warren	Topeka	Kansas Inc.
Ted Kuwaza	Lawrence	Univ. Kansas
Billie Archer	Lawrence	KU - KSTAR
Cindy Diehl	Topeka	KTEC
Susan J.G. Wollesen	Manhattan	KVAC
CLYDE C. ENGERT	TOPEKA	ITEC
Janie Rutherford	Topeka	KTEC
MIKE WOJCICKI	"	"
Bill Brundage	topeka	ICTE
John Carlin	Lawrence	MSI
Craig Covington	Des Moines IA	Independent writer
Ralph Lagergren	Winfield, KS	Agri-Technology
DAN ROEHLER	OVERLAND PARK	KS S+T COUNCIL

Kansas

WHAT ARE THE ISSUES?

1. Why is Kansas an EPSCoR State?

   * Kansas = $18/capita
   * National average = $38/capita (1990)

   Difference of $20/capita x 2.4 million Kansans = > $40 million of Kansas Federal tax dollars for R&D is going to other states!

2. A clear understanding of EPSCoR -

   * The challenge - stimulation not support - sustaining improvements
   * Not an entitlement - a merit based program
   * Requires a coalition of support
   * Needs a strong commitment from the state

3. Why are we not competitive?

   * Priorities and expectations
   * Barriers
     - leadership and priorities
     - human resource
       (women & minorities)
     - infrastructure
       (e.g., equipment, facilities, grant development, etc.)

4. Where are we and what are we going to do? Competitive by year 2003?

   * Current status (e.g., NSF K*STAR, EPA, DEPSCoR, DOE, NASA)
   * Goals and strategies
   * State $ commitments
   * What has EPSCoR accomplished with other states?

5. Economic value of academic research and technology transfer issues

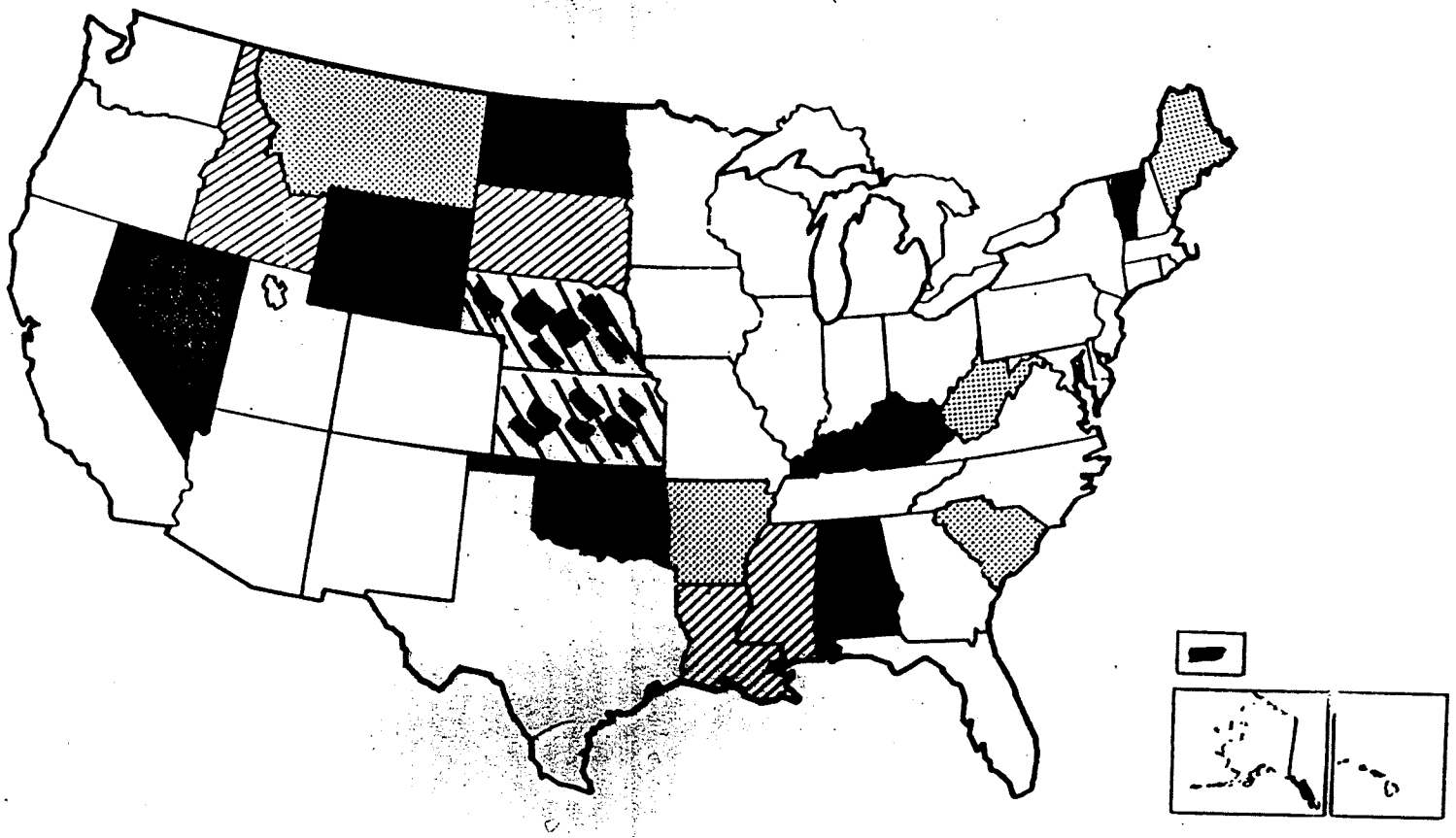
   * $'s (Federal vs state and other sources)
   * Stimulation by EPSCoR (evidence from other states)
   * $'s value of academic research (28% est. E. Mansfield Report)
   * Role of basic research
   * What is needed for technology transfer?

6. Assessment and accountability

   * What do we assess?
   * What are the benchmarks for success?
   * Third party assessments (Federal and local level assessments)

House Economic Development
September 27, 1993
Attachment 1

EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH



ARKANSAS
MAINE
MONTANA
SOUTH CAROLINA
WEST VIRGINIA

ALABAMA
KENTUCKY
NEVADA
NORTH DAKOTA

OKLAHOMA
PUERTO RICO
VERMONT
WYOMING

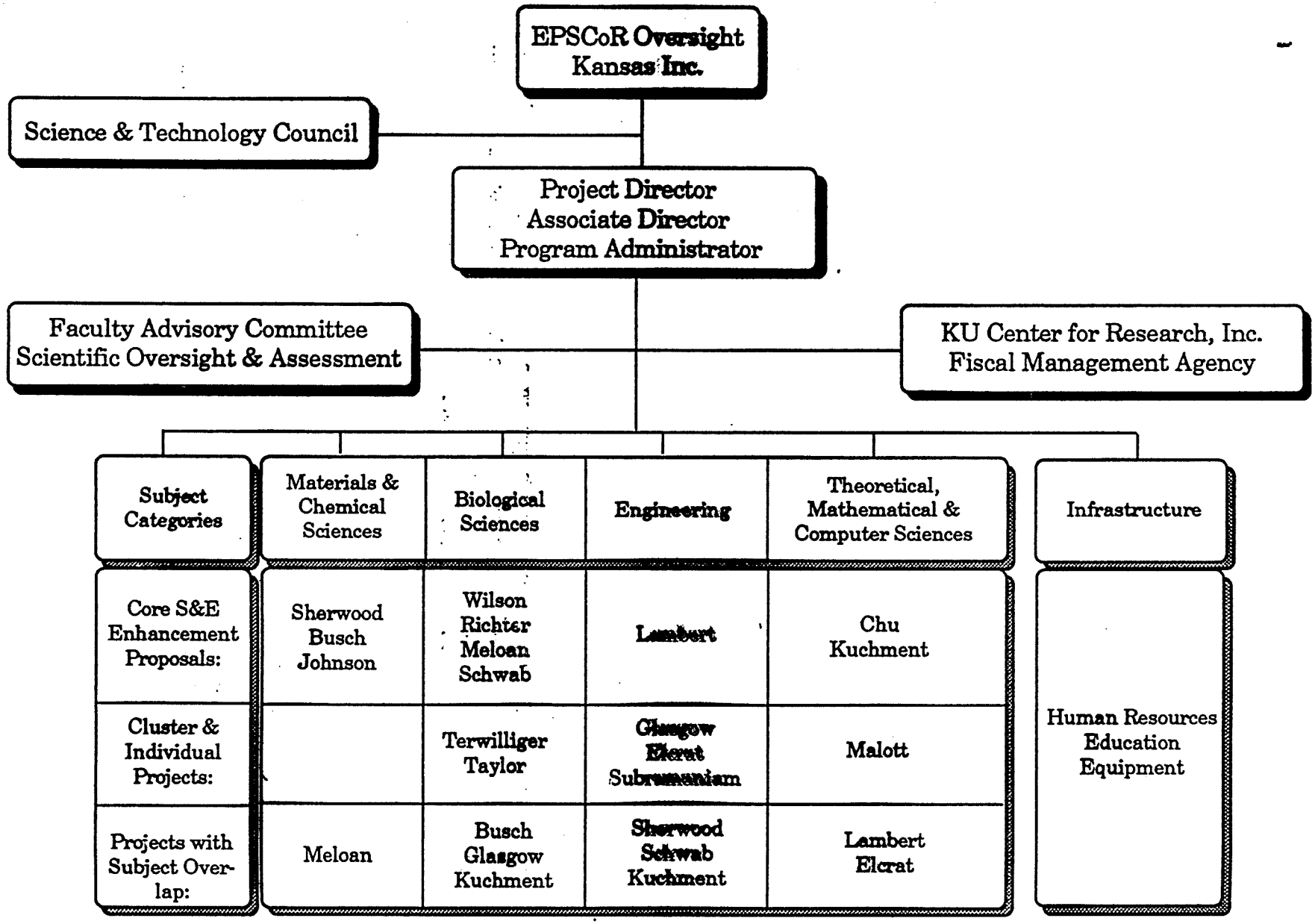
IDAHO
LOUISIANA
MISSISSIPPI
SOUTH DAKOTA

KANSAS
NEBRASKA

EPSCoR - STIMULUS FOR CHANGE

- "Stimulation" NOT "Support"
- Permanent Improvements in Infrastructure
- To Build R&D Capacity

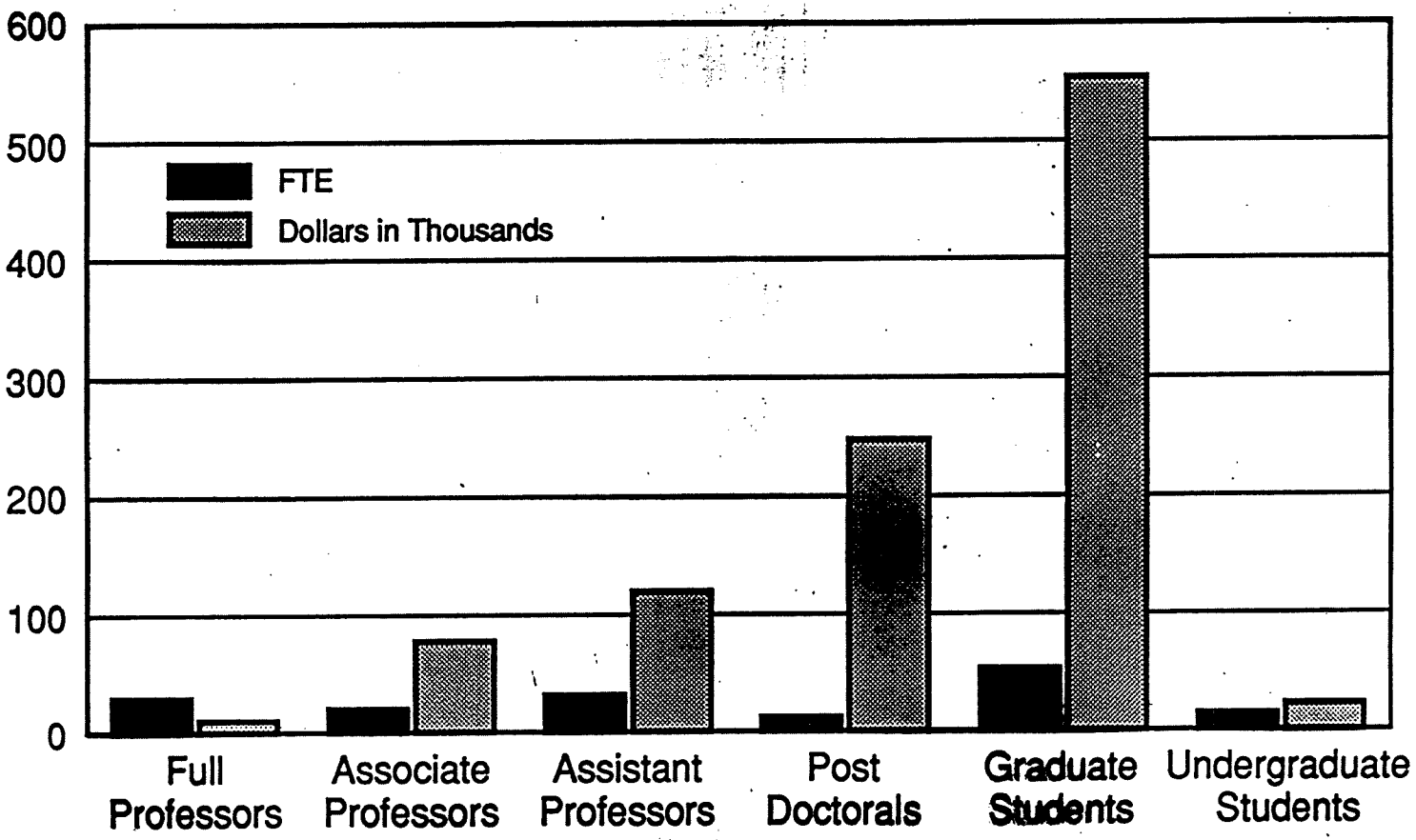
A STATEWIDE PROGRAM



Subject Categories	Materials & Chemical Sciences	Biological Sciences	Engineering	Theoretical, Mathematical & Computer Sciences	Infrastructure
Core S&E Enhancement Proposals:	Sherwood Busch Johnson	Wilson Richter Meloan Schwab	Lambert	Chu Kuchment	Human Resources Education Equipment
Cluster & Individual Projects:		Terwilliger Taylor	Glasgow Elcrat Subramaniam	Malott	
Projects with Subject Overlap:	Meloan	Busch Glasgow Kuchment	Sherwood Schwab Kuchment	Lambert Elcrat	

*Organizational Plan for K*STAR NSF EPSCoR Program*

K*STAR Human Resources
First Year



WHAT ARE NEIGHBORING STATES DOING?

COMPARISON OF FEDERAL R&D FUNDS TO UNIVERSITIES & COLLEGES BY STATE				
State	1983 to 1990 (In thousands)	% Change	1990 Census (In thousands)	$ Per Capita 1990
Colorado	83,570 - 168,905	102	3,294	51
Iowa	53,229 - 106,735	101	2,777	38
Missouri	86,389 - 169,883	97	5,117	33
Nebraska	14,714 - 29,379	100	1,578	19
Kansas	24,765 - 44,005	78	2,478	18
Oklahoma	21,429 - 35,866	67	3,146	11

Source NSF: Federal Support to Universities, Colleges and Non-Profit Institutions Fiscal Year 1990 (NSF 92-324).

WHAT ARE NEARBY UNIVERSITIES DOING?

COMPARISON AMONG INSTITITIONS FOR TOTAL AND FEDERAL R&D FUNDS IN 1990
(In thousands)

Institution	Total $* (rank)	Federal Obligation $ (rank)	Engr $*	Phys. Scl. $*	Math/Comp. Sci. $*
U. of Colorado	154,723 (29)	142,413 (21)	20,660	21,438	4,198
Iowa State U.	115,945 (45)	58,104 (67)	29,974	5,396	8,314
U. of Iowa	115,778 (46)	93,991 (32)	9,707	17,498	1,745
U. of Nebraska	77,598 (71)	a	9,709	4,642	1,316
Colorado State U.	77,967 (78)	54,633 (71)	16,026	4,658	1,023
U. of Kansas	61,144 (92)	41,198 (91)	4,318	6,635	437
U. of Oklahoma	58,645 (95)	a	8,735	5,030	2,444
Kansas State U.	50,311 (101)	a	6,186	3,287	673
Wichita State U.	3,196 (253)	a	2,058	270	127

* Includes federal and non-federal dollars for S&E a. Not in top 100

Source NSF: Academic Science/Engineering R&D Expenditures Fiscal Year 1989 (NSF 92-321)

	Enrollment		Freshman	Student/	Tuition		Admissions test scores		Graduation rates,
	Undergraduate	*Graduate*	Class, 1992-93	faculty ratio	*In state*	*Out of state*	*Median*	*Range*	Average freshman class,
THE BIG EIGHT									
Colorado	18,944	5,076	14,344 applied 9,899 accepted 3,441 enrolled	19-to-1	$2,423	$10,350	ACT: 24 to 28*	ACT: Less than 10% below 21* 25% above 28*	In four years: 36% In five years: 58% In six years: 61%
Kansas	18,219	10,243	7,739 applied 5,091 accepted 3,352 enrolled	17-to-1	$1,662	$5,340	ACT: 23	27% below 21 12% above 28	In four years: 26% In five years: 47% In six or more: 53%
Kansas State	15,311	2,154	5,691 applied 4,596 accepted 2,764 enrolled	8-to-1	$1,699	$5,376	ACT: 22	36% below 21 10% above 28	In four years: 20% In five years: 42% In six years: 47%
THE BIG TEN									
Illinois	25,465	8,841	15,024 applied 10,892 accepted 5,651 enrolled	11-to-1	$3,054	$6,806	ACT: 25	5% below 21 31% above 28	In four years: 52% In five years: 74% In six years: 78%
Iowa	15,977	8,964	7,796 applied 6,811 accepted 2,907 enrolled	9-to-1	$1,952	$6,470	ACT: 24	14% below 21 14% above 28	In four years: 24% In five years: 51% In six years: 59%
Northwestern	7,402	4,417	11,415 applied 5,319 accepted 1,946 enrolled	9-to-1	$14,370, including fees		ACT: 30	1% below 21 55% above 28	In four years: 78% In five years: 86% In six years: 88%

* Scores are according to University of Colorado estimates

Sources: The Big Eight Conference; the Big Ten Conference; Barron's Profiles of American Colleges, the 19th Edition, copyright 1992; and in some instances individual school admissions offices

September 20, 1993 - Statewide EPSCoR Conference

NEEDS DEDUCED FROM ASSESSMENT OF BARRIERS

* Provide administrative leadership that projects a vision for building competitive S&E, including large programmatic grants.

* Implement systems of incentives, support and reward to prioritize research. Make grant activity an institutional imperative, not just an expression of individual entrepreneurship.

* Acquire state-of-art equipment and increase operating/maintenance support. Remove barriers that hamper purchase of research equipment.

* Increase the emphasis on doctoral education and provide competitive stipends for graduate students as a means of driving the basic research mission of the university.

* Increase the number of SEM faculty and faculty salary competitiveness.

* Provide more seed money and travel support. Improve services to minimize the routine work researchers must perform to obtain grants. Ensure early notice of "request for proposals" from funding sources.

ASSESSMENT

1. Funding

* # proposals submitted
* # proposals awarded
* dollar value

Benchmarks — faculty competitiveness

* publications (peer reviewed)
* national & international recognition
* service on policy making panel, etc.

2. Infrastructure supporting research

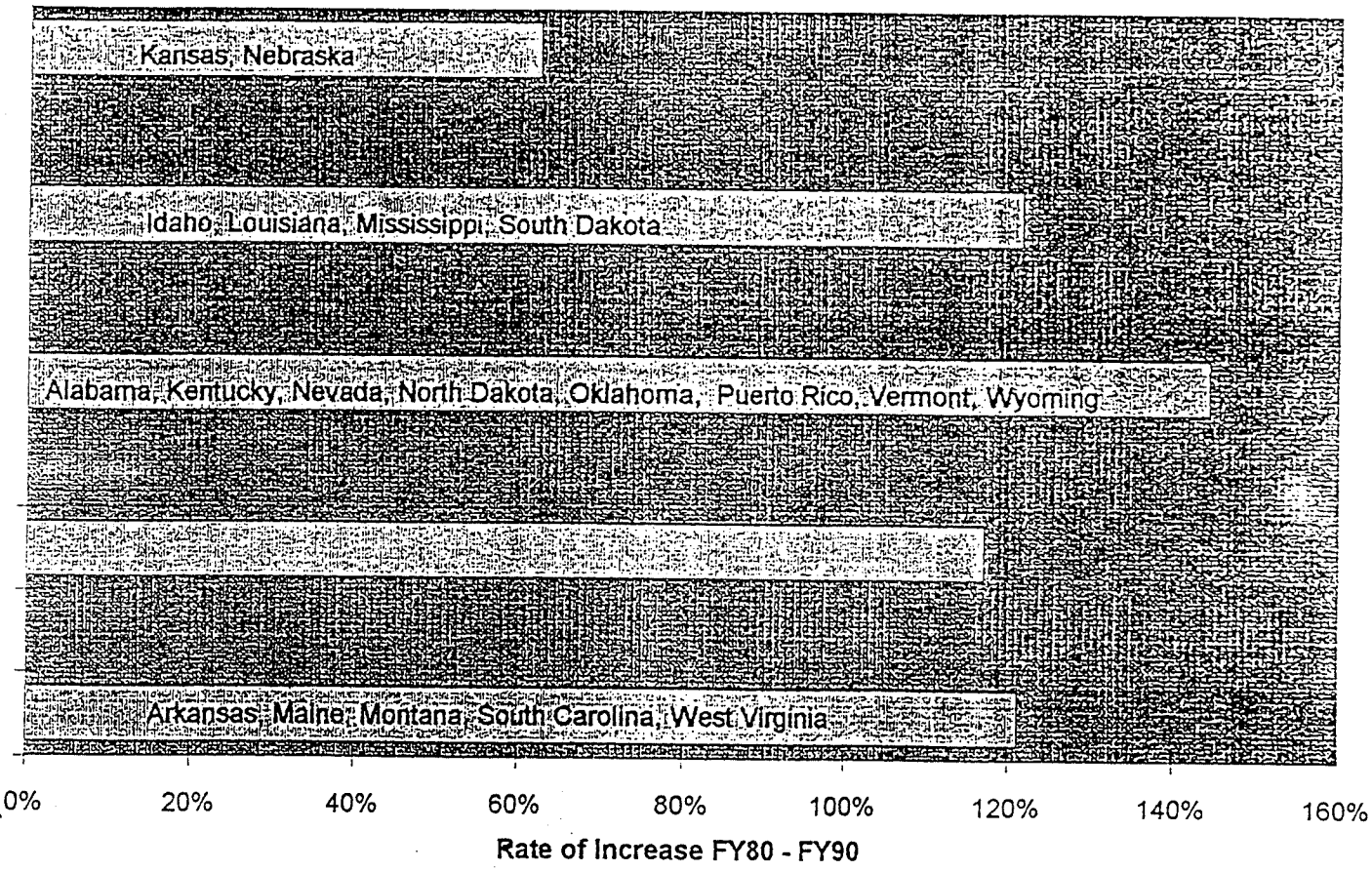
* new state & university management/organizational structures (develop strategies, goals, state $'s)
* human resource development
* facilities, equipment, library, shops, etc.
* grant support (development and administration)

3. How assessment conducted? Who & source of database —

* Feds: Quantum Research Corp., COSMOS & AAAS
* EPSCoR State — advisory: Ad Hoc Task Force
* K*STAR
  - KU – Institute for Public Policy and Business Research (Beth Stella)
  - KSU – Institute for Social and Behavioral Research (M. Duane Nellis)
  - WSU – Center for Economic Development and Business Research (Carlene Hill Forrest)

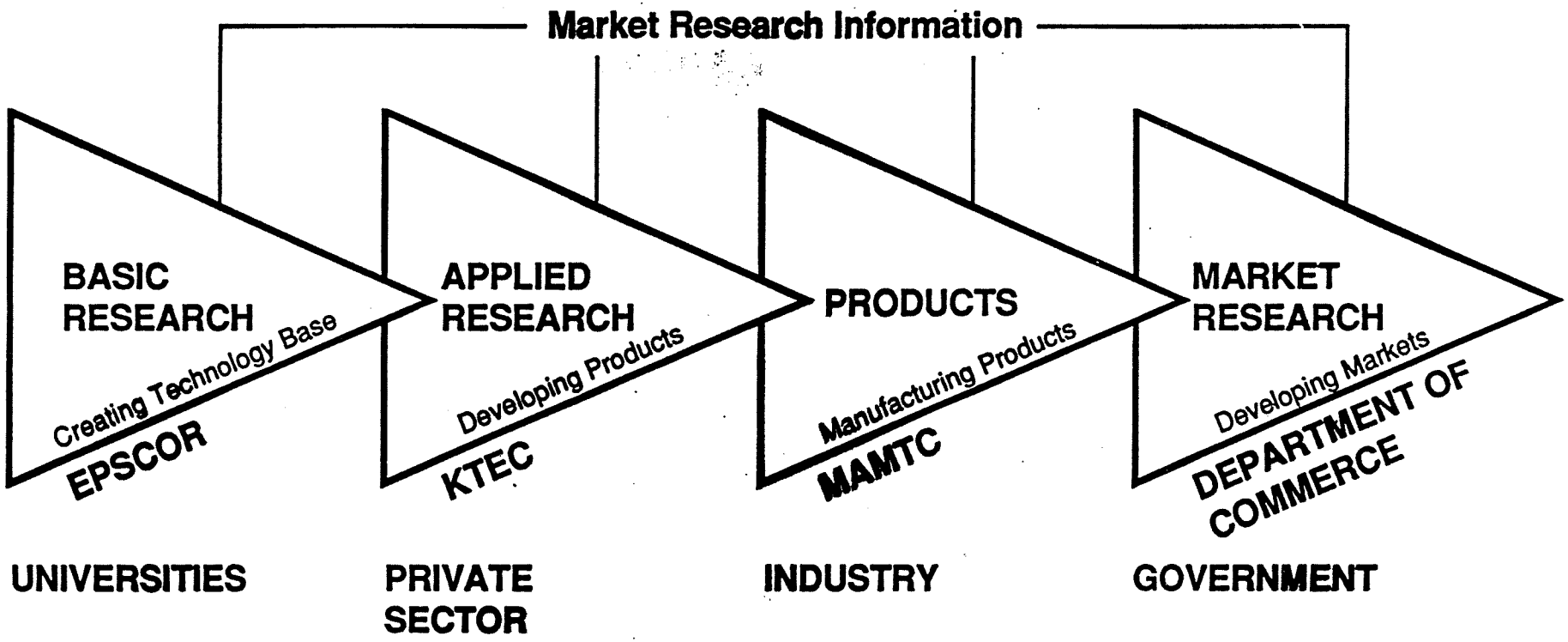
EPSCoR States Exceed FY1980-90 Rate of Increase in Federal R&D Support for U.S. Average

year, joined EPSCoR



SOURCE: NSF Survey of Federal Support to Colleges, Universities, and Selected Nonprofit Institutions

State Model To Foster Technology And Economic Competitiveness



KTEC = Kansas Technology Enterprise Corp., wholly owned corporation of the state. Hi-tech economic development agency. Yearly budget $8-10 million.

MAMTC = NIST/Mid-America Manufacturing Technology Center ($12.5 million/5 years) to improve manufacturing competitiveness.

SEPTEMBER 1993

FY '94 GOALS for EPSCoR FUNDING
EXECUTIVE SUMMARY
MILLIONS OF DOLLARS

	FY '90	ADMIN. REQUEST FY '91	AS ENACTED FY '91	ADMIN. REQUEST FY '92	AS ENACTED FY '92	ADMIN. REQUEST FY '93	AS ENACTED FY '93	CLINTON REQUEST FY '94	GOAL FY '94	FORECAST F '94
NSF	8	10	11.0	15	19[1]	19.5	24.5	24.5	34.5	31.0
DOE	0	0	4.0	0	5	0	5.0	2.0	11.5	7.5
USDA	0	0	7.0	0	10	0	10.0	0	13.0	13.0
NIH	0	0	0.0	0	2[2]	0	0.75	0	15.0	?
DOD	0	0	7.0	0	10	0	12.0	0	20.0	20.0
NASA	0	0	2.5	0	4	4.5	14.5[3]	9.5[4]	20.0[4]	14.5
EPA	0	0	1.0	0	0	0	0.8	0	5.0	3.0
TOTAL	**8**	**10**	**32.5**	**15**	**50**	**24.0**	**67.55**	**36**	**119**	**89.0**

1 REDUCED ADMINISTRATIVELY TO $18.5 MILLION.

2 RECOMMENDED IN DIRECTOR'S DISCRETIONARY ACCOUNT — WAS NOT SPENT.

3 IN ADDITION TO THE $4.5 MILLION FOR SPACE GRANT PHASE II, CONGRESS AUTHORIZED NASA TO SPEND UP TO $10.0 MILLION ON NASA-EPSCoR. NASA WILL SPEND $5.0 MILLION.

4 FY '94 NASA FIGURES INCLUDE $4.5 MILLION FOR SPACE GRANT PHASE II.

Phil Anderson
Kantronics

09-26-93

on strategic thinking
strategy
business plan

1. For product-concept and technology driven businesses:

At lease three areas of excellence are needed:
1.1 applied research
1.2 applications marketing
1.3 quality of product and service

1.1
By pushing technology harder than competitors, new applications, new products, and new markets will emerge. Ten percent of sales is not an unusual budget for technology-based companies: Sony, Merck, Pfizer.

1.2
To niche is to win; however, most technology companies don't seem to know how to niche. PC and T companies must "cultivate applications marketing as an area of excellence."
The pool of market-technology professionals is even smaller than the pool of university-based researchers. These professionals are the handful that can market and understand the technology sufficiently at the same time.

1.3
The product, technology, and service simply must be better than that of the competitors. Hence, if resources are limited, efforts must be focused [sharp, arrow like].

2. Why limit (focus on) just a few areas of excellence?

2.1 Because no company has resources to develop all areas.
2.2 Give excellence areas preferential budget treatment.
2.3 The secret to success is constancy of purpose, not losing focus. [Drucker, among others].

2.1
Small companies can WIN by focusing their limited resources, which include time and talent as well as dollars.

2.2
Simply load the budgets of those activities that matter the most.

2.3
A strategic plan, a purpose, a focus, is a tremendous help in fending off "seductive opportunities," those off the path quick money deals.

House Economic Development
September 27, 1993
Attachment 2

3. Any business rests on two foundations: the strategy [or driving force: a product concept, a techology] and the areas of excellence in skills. Technology cannot be the only excellence. Simple analogy, fire needs heat, air, and fuel.

4. Perhaps the lesson to be learned [a strategy to follow] is that....

   The CEO, researchers, and marketers must clearly understand what is the driving force of the business that constitutes its strategic weapon and competitive advantage.

   It may be that this is the key most often missing in moving technology from lab application.

references:

-, *Breakthroughs*, [? Arthur D. Little & Co.]

Dent, Harry, *The Great Boom Ahead*, Hyperion, 1993

Hitt, William, *The Leader-Manager, Guidelines for Action*, Battelle Press, 1988

MacKensie, Kenneth, *The Organizational Hologram: The Effective Management of Organizational Change*, Kluwer, 1991

Robert, Michel, *Strategy Pure and Simple*, McGraw Hill, 1993

Tregoe, Menjamin etal, *Vision in Action*, Simon & Schuster, 1989

House Economic Development
September 27, 1993
Attachment 3

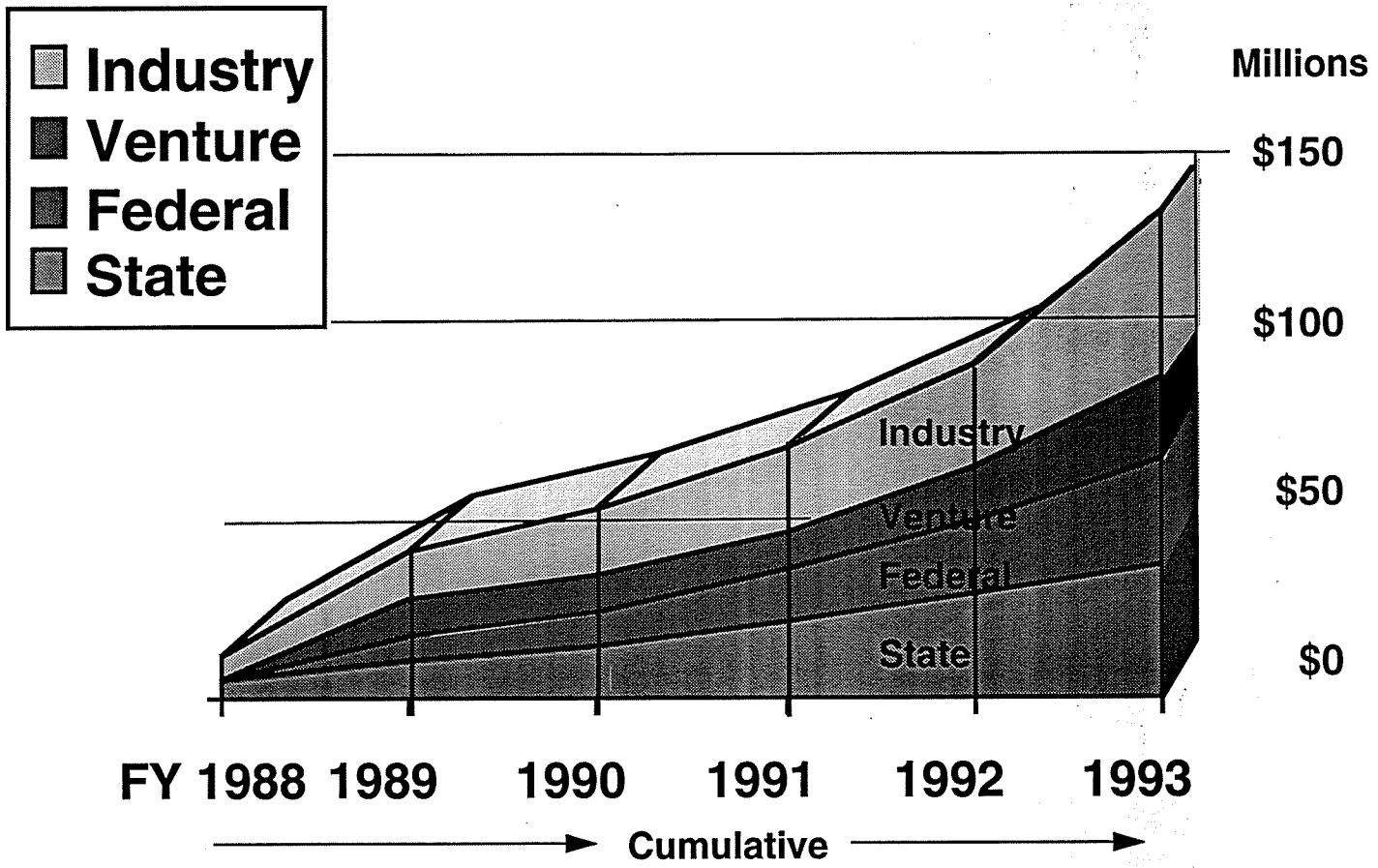
Presentation to the
House Economic Development Committee

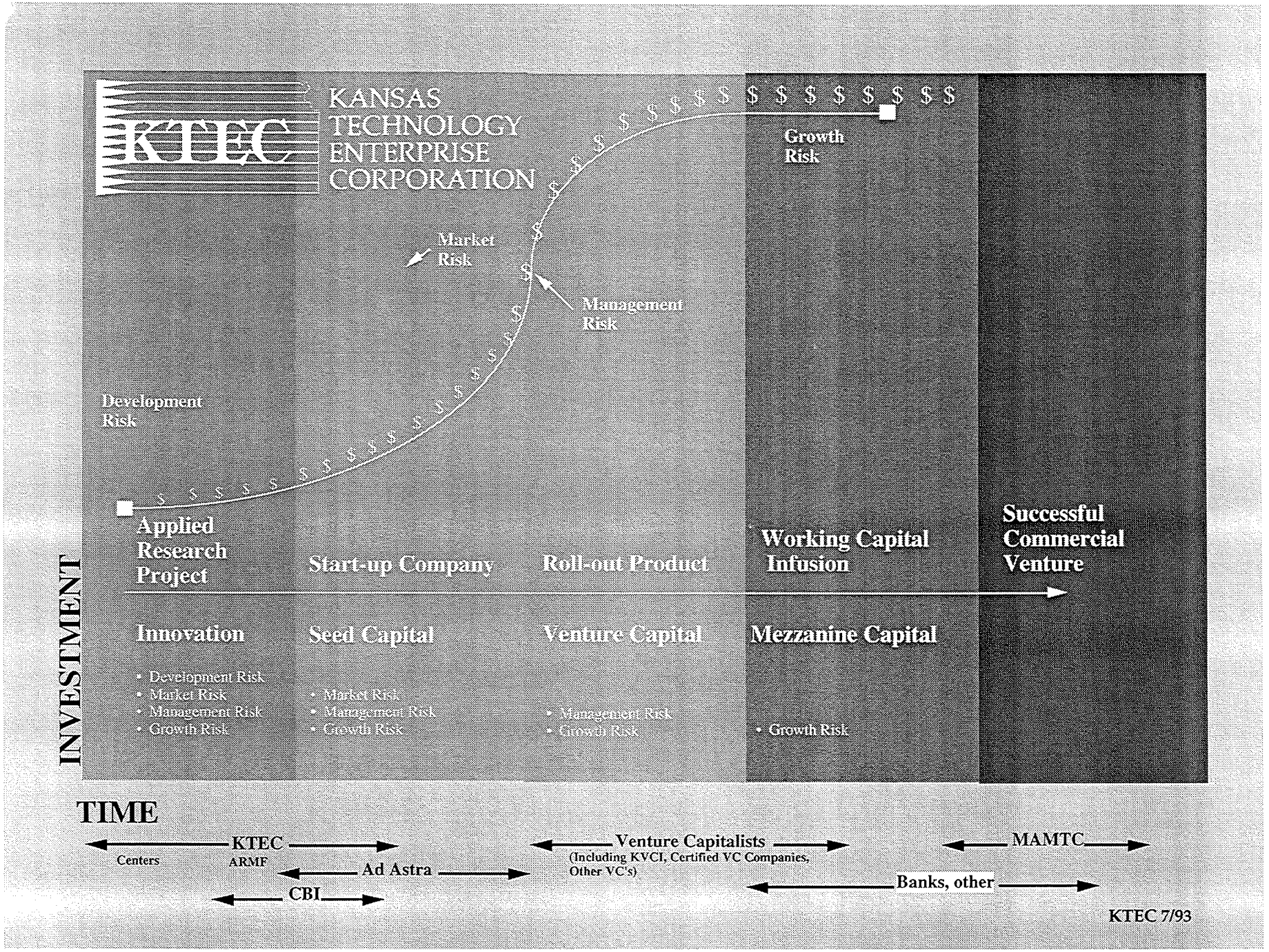
Innovation and Commercialization Network

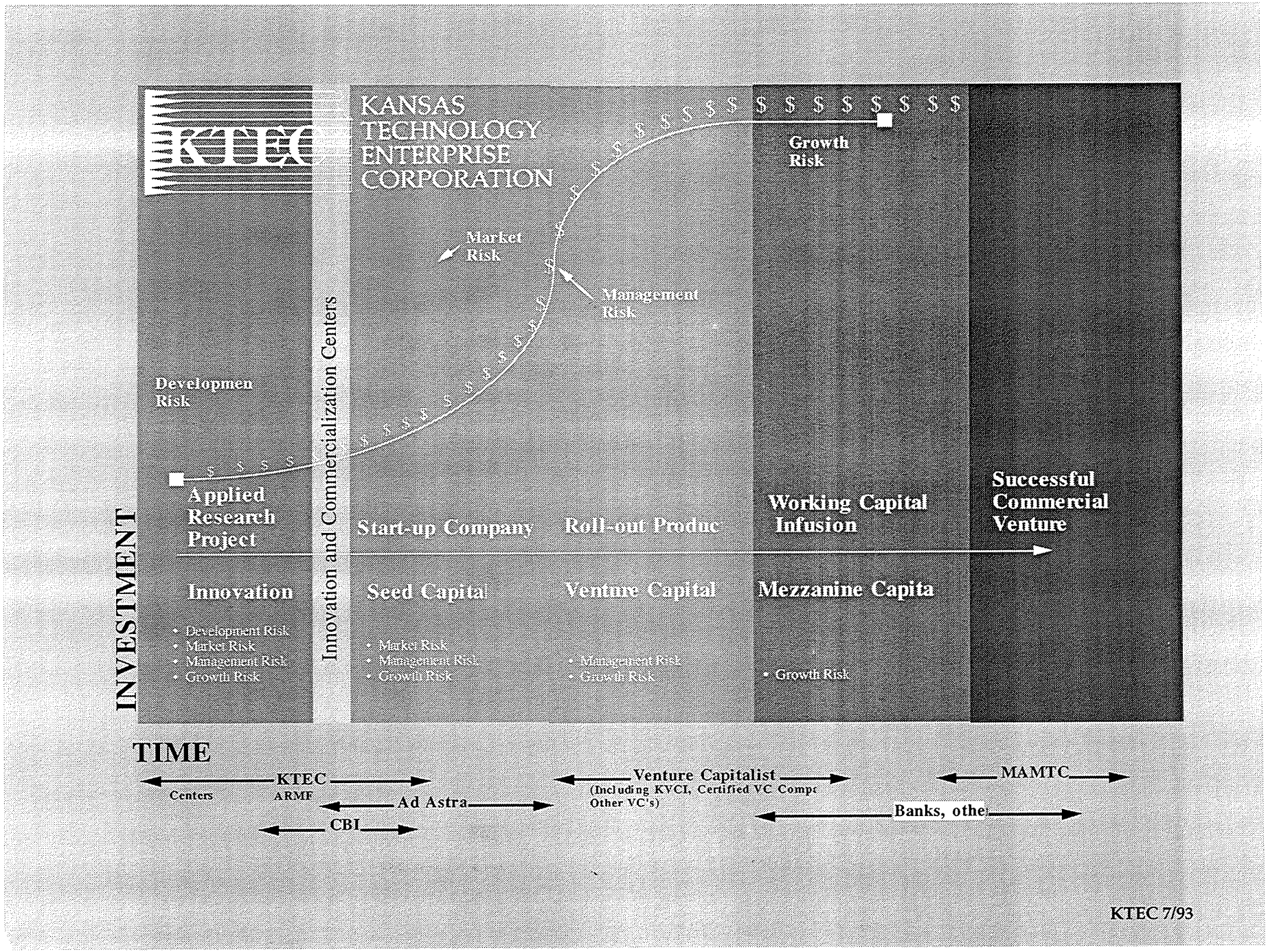
William G. Brundage, Ph.D.
President
Kansas Technology Enterprise Corporation

September 27, 1993

Kansas Technology Enterprise Corporation
Sources of Funding, FY 1988 - FY 1993




KANSAS
TECHNOLOGY
ENTERPRISE
CORPORATION
KTEC
Growth
Risk
Market
Risk
Management
Risk
Development
Risk
Applied
Research
Project
Start-up Company
Roll-out Product
Working Capital
Infusion
Successful
Commercial
Venture
INVESTMENT
Innovation
Seed Capital
Venture Capital
Mezzanine Capital
• Development Risk
• Market Risk
• Management Risk
• Growth Risk
• Market Risk
• Management Risk
• Growth Risk
• Management Risk
• Growth Risk
• Growth Risk
TIME
KTEC
Centers
ARMF
Ad Astra
CBI
Venture Capitalists
(Including KVCI, Certified VC Companies,
Other VC's)
MAMTC
Banks, other
KTEC 7/93


KANSAS
TECHNOLOGY
ENTERPRISE
CORPORATION
Market
Risk
Management
Risk
Growth
Risk
Development
Risk
Innovation and Commercialization Centers
INVESTMENT
Applied
Research
Project
Start-up Company
Roll-out Produc
Working Capital
Infusion
Successful
Commercial
Venture
Innovation
• Development Risk
• Market Risk
• Management Risk
• Growth Risk
Seed Capital
• Market Risk
• Management Risk
• Growth Risk
Venture Capital
• Management Risk
• Growth Risk
Mezzanine Capita
• Growth Risk
TIME
KTEC
Centers
ARMF
Ad Astra
CBI
Venture Capitalist
(Including KVCI, Certified VC Compa
Other VC's)
MAMTC
Banks, othe
KTEC 7/93

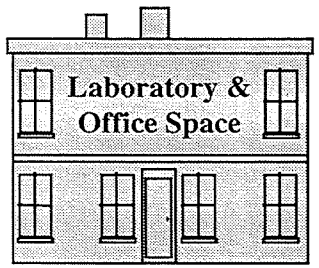
Investment Grade Technologies

Development Risk

Innovation and Commercialization Centers

Applied Research Project

- **Business Plan Consulting**
- **Financial Expertise**
- **Management & Operations Consulting**
- **Marketing & Sales Strategies**
- **Guidance in Accessing Financing**



Start-up Company

Market Risk

Innovation

- **Development Risk**
- **Market Risk**
- **Management Risk**
- **Growth Risk**

- Receptionist
- Photocopying
- Fax machine
- Mail & message Hdlg.
- Word processing
- Shared computers
- Conference room
- Security

- Janitorial service
- Loading docks
- Seminars
- Legal service
- Accounting assistance
- Relocation assistance

Seed Capital

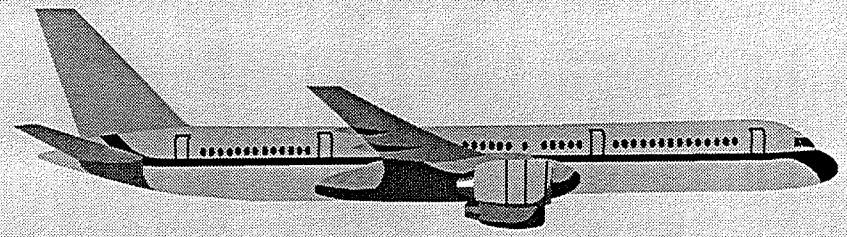
- **Market Risk**
- **Management Risk**
- **Growth Risk**

Quality Investments

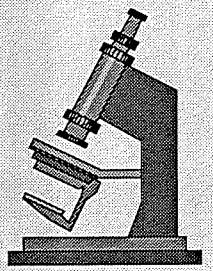
Ad Astra

KTEC

KTEC 7/93



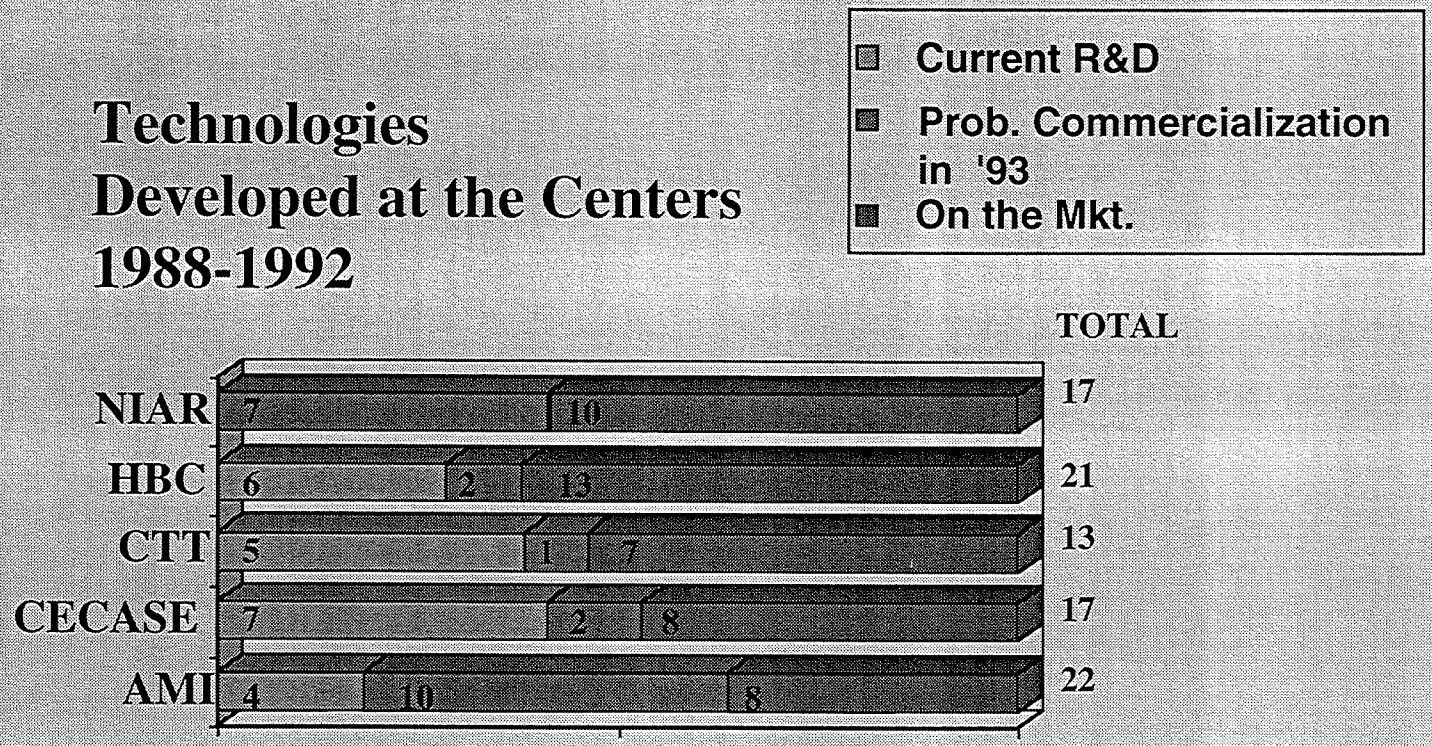
Technologies Developed Through KTEC Programs 1987-1993



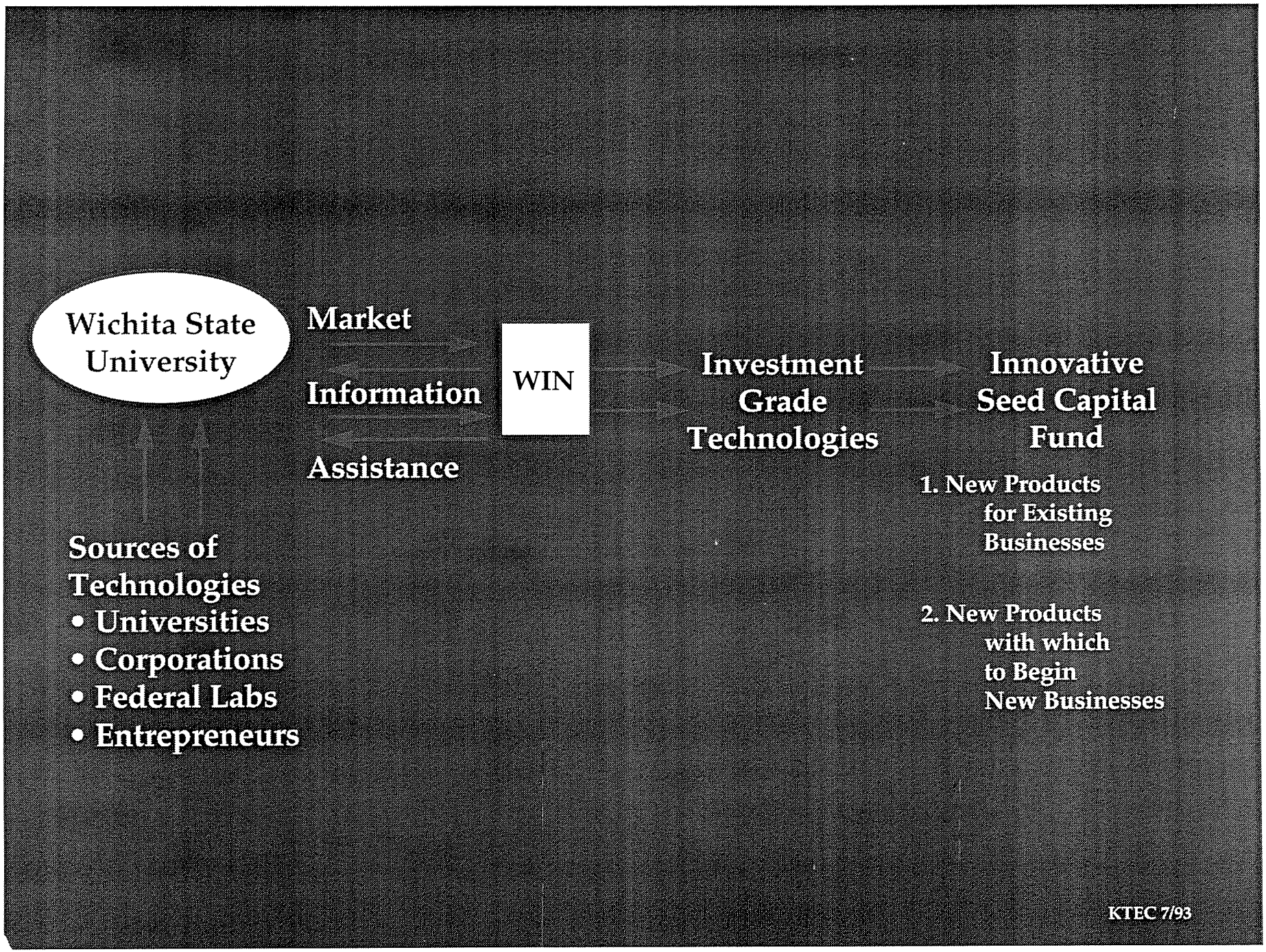
192

KTEC 7/93

Technologies Developed at the Centers 1988-1992

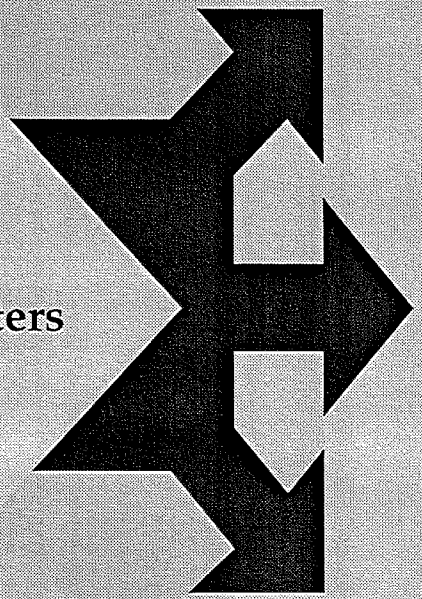


KTEC 7/93


Wichita State University
Market
Information
Assistance
WIN
Investment Grade Technologies
Innovative Seed Capital Fund
1. New Products for Existing Businesses
2. New Products with which to Begin New Businesses
Sources of Technologies
• Universities
• Corporations
• Federal Labs
• Entrepreneurs
KTEC 7/93

RESULTS

Innovation and Commercialization Centers



Reduce Risk

Reduce Investment

Increase Opportunities

Increase Success

KTEC 7/93

Pre-Investment
INVESTMENT DECISION PROCESS

- Technical Review
- Business Plan Consulting
- Financial Expertise
- Management & Operations Consulting
- Market Research
- Due Diligence

SEED CAPITAL FUND

KTEC/CBI NETWORK

Center for Business Innovation
Mid-America Manufacturing Technology Center
Ernst & Young Entrepreneurial Network
Campbell-Becker Inc.

Wichita Innovation Network
Lawrence Innovation Network
Manhattan Innovation Network

KTEC 7/93

Post Investment

INVESTMENT STABILITY

Resources

KTEC/CBI Network
$30-35 M

- Center for Business Innovation
- Mid-America Manufacturing Technology Center
- Ernst & Young Entrepreneurial Network
- Campbell-Becker Inc.

- Wichita Innovation Network
- Lawrence Innovation Network
- Manhattan Innovation Network

Build the Companies

Technologies →
Scientists →
Engineers →
Interns →
Pilot Plants →
Incubators →
Management →
Marketing →
Product Development →

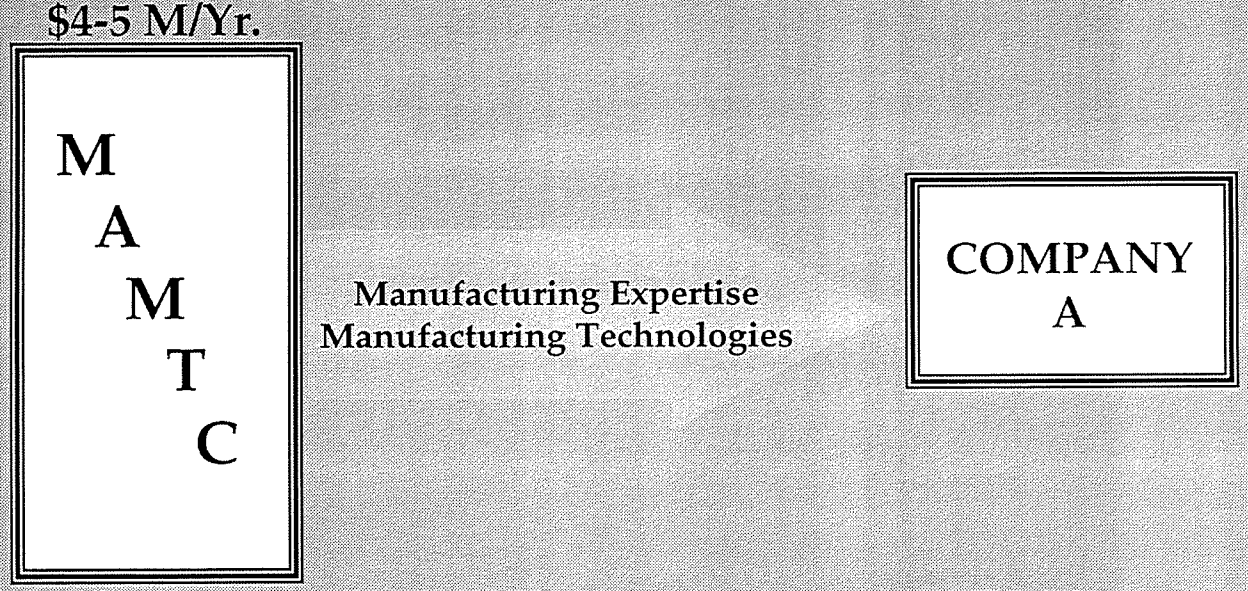
COMPANY A

KTEC 7/93

Post Investment

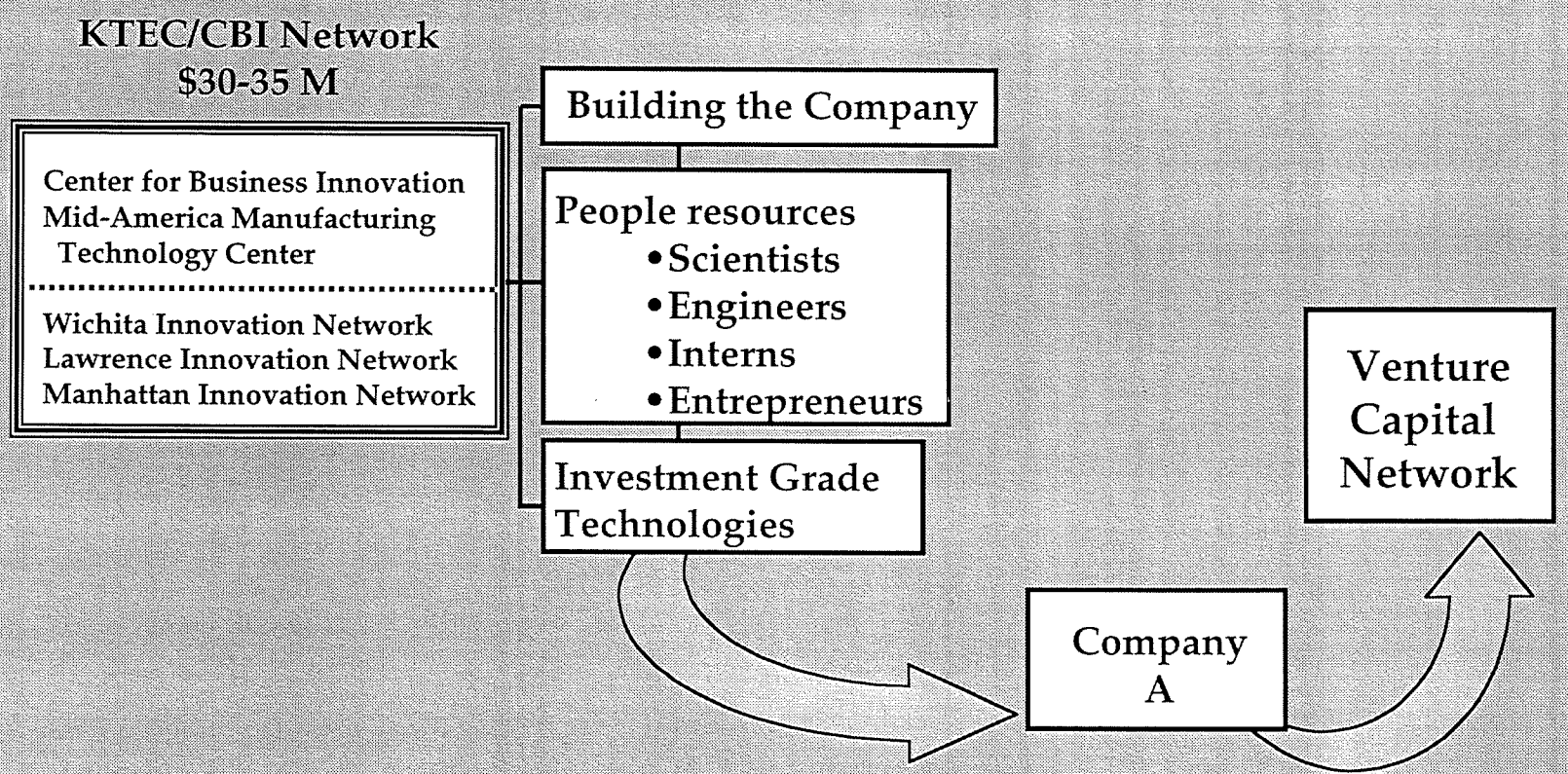
INVESTMENT STABILITY

Resources



KTEC 7/93

VALUE-ADDED


KTEC/CBI Network
$30-35 M
Center for Business Innovation
Mid-America Manufacturing Technology Center
Wichita Innovation Network
Lawrence Innovation Network
Manhattan Innovation Network
Building the Company
People resources
• Scientists
• Engineers
• Interns
• Entrepreneurs
Investment Grade Technologies
Company A
Venture Capital Network
KTEC 7/93

BEST PRACTICES FOR SUCCESSFUL INCUBATORS

Dr. Jana B. Matthews
Center for Entrepreneurial Leadership
Ewing Marion Kauffman Foundation

Hi. I'm Jana Matthews. I'm Senior Fellow and Director of Entrepreneurial Leadership at the Kauffman Foundation.

Our center was established about I l/2 years ago to help entrepreneurs understand how to grow successful companies. We are looking at a variety of support mechanisms which will help entrepreneurs grow those companies including such things as research parks, venture capital, incubators and that is the set of programs for which I am responsible.

One of the things I am most excited about at the moment is the development of a handbook Best Practices in the Development and Management of Successful Incubators. You may recall that incubators are places where small companies start up and grow, hopefully grow to be successful companies. We are working very hard with a group of five contributing authors, as well as another expert in the incubator field, to develop not just a handbook of how to do an incubator but one we facetiously said how are we going to create a million of tomorrow jobs today and that is by having successful incubators.

Let me tell you a little bit about the incubators themselves, as an industry, and then let me tell you about the ten best practices we are focusing on in our book.

GROWTH IN BUSINESS INCUBATOR

from 10 to 525 in 12 years

Incubator industry is not a very old industry but it is definitely a growth industry. About twelve years ago there were about ten incubators in the United States. Some of the most famous ones were ones located at Renslar Technology Park and in Georgia at the Advanced Technology Development Center. Now we have 525 incubators and they are being added at a rate of about five per week. In addition, incubators are developing all over the world and the Director of the Incubation Association is traveling to England, Ireland and Australia, and all over,

House Economic Development
September 27, 1993
Attachment 4

helping other countries set up business incubators.

INCUBATORS ARE EFFECTIVE MECHANISMS FOR
. economic development
. job creation

when the focus is on helping companies grow

We have found that incubators are extremely effective mechanisms for things you are all interested in, that is, economic development and job growth - but they are most effective when you understand the focus is on helping companies grow. Creation of jobs will come, economic development will come, if the focus is on helping companies themselves to grow.

INCUBATORS vs. INCUBATION
Incubator is physical facility in which

. start-up companies
. re-locate
. share space and services
. are guided by executive director

Let me differentiate a little bit between incubators and incubation. Incubators have a three part definition: they are physical facilities within which a number of companies co-locate. They share their space and they share services like fax, secretarial, phone and etc. and there is an executive director who plays a variety of roles, directly assists and help them, directs them to other kinds of services, directs to what we call the know-how network of people and organizations in the community who can help and provide them assistance in thinking through strategies, connecting up with the right lawyers, and helping them think about strategic partner arrangements with large companies and a whole variety of things that will lead to companies being successful.

Being located in a physical facility is really important for entrepreneurs because:

1. they find out they are not alone - there are other people in the same boat
2. they learn from each other. One will learn what is required when you go into a bank for a loan, and he or she will share that information with others.
3. there is a comradeship that develops and a learning that develops among the tenants in the incubator
4. they often end up buying and selling services and products to each other as they develop their own particular companies

So the physical facility is important.

INCUBATOR vs. INCUBATION

Incubation is the process of helping companies grow

Incubators are the means:

Successful companies are the end.

However, the process of incubation is the process of helping companies grow and that process can go on with companies inside the incubator and companies outside the incubator, depending on the set of services you structure and provide for them. What we are saying here is incubators are a very important means but successful companies are really the end we are concentrating on.

HANDBOOK

"State of the art" and best practices for managing and developing incubators

Five contributing authors and two co-authors

As I mentioned, the Foundation, through the Center for Entrepreneurial Leadership, is developing a handbook that we are saying is state of the art in terms of best practices for managing and developing incubators. We are not just sharing war stories or sharing stories of successful incubators. We really tried to step back and analysis what we would consider the best practices and if one were to establish an incubator based on these best practices it will have the highest probability of success.

As I said, we have had five contributing authors and two co-authors working on this and they are experts around the country who are helping us think about this problem.

Let me share with you the ten best practices that we have identified.

1. MISSION

Select "development of companies" as incubator's mission

First of all is establishing the mission of the incubator and we urge you to consider the development of companies as the primary mission of the incubators. They may indeed be set up in inner city areas, they may be for redevelopment, they may be for regional economic development, but you must realize the focus must be on developing companies themselves.

2. CRITICAL SUCCESS FACTORS

.Identify necessary conditions for incubator success

You must understand the critical success factors that are required for incubators to be successful. One of those is to do a successful and careful feasibility study. The National Business Incubation Association has developed all kinds of resources that you can use and one is an excellent handbook prepared by Dr. Robert Meador on Feasibility Studies for Incubators but the fact is - you need to develop the business plan for the incubator just as you would for a start up company - because, in fact, incubators are start up companies.

3. MANAGE INCUBATORS AS A BUSINESS

Expect incubator to experience problems of a "growth company"

You need to manage and think about managing an incubator as a business. This is not something to which you are going to give subsidies. Think of it as an entity to which the public may make an investment for a future return, which will be the development of companies and eventually jobs. But both the incubator and the people putting it together, and the director, need to think of the incubator as a company that will be going through start up stages, stages of development, have different needs, have cash flow problems, have to think about how it will have to market itself, what is its role versus the other competition, other services that provide help to entrepreneurs, but it must be directed and governed as if it were a business, not a for profit, charitable entity.

4. STAKEHOLDERS

Maximize leverage gained from stakeholder involvement

The 4th best practice would be to figure out who the stakeholders are and to maximize the leverage gained by investing with all those stakeholders. That is, people in the community who stand to benefit from an incubator. Who are they, what do they want from it, what do they need from it and what relationship should the incubator have to them.

5. GOVERNANCE

Establish effective board but minimize time/resources spent meeting

The 5th concerns governance. You certainly want a board for this incubator but you need to establish an effective board that will spend a minimum amount of time in meetings and in perpetuating its ownself and maximum amount of time in figuring out how it can be a resource to the company and helping them with their needs. We have a variety of stories and case studies of places where the incubator people began to concentrate on the incubator as an end in itself and perpetuation of the incubator as opposed to a means where it will really be helping other companies grow.

GOVERNANCE

.role of Board of Director
. provide buffer for entrepreneurs
. help organize the know-how network
. be responsible for external relations

The role of the board is to provide a buffer for the incubator versus the rest of the community organizations to help organize what we call the

"know-how" network, all of those people in the community who will help the entrepreneur learn how, and then know how, to run a successful business and finally be responsible for the external relations function of the incubator.

6. DIRECTOR

Recognize the Director is the key to incubator effectiveness

The 6th best practice concerns the director - the kind of person you hire. We recognize the director is absolutely the key to the effectiveness of the incubator.

DIRECTOR

Characteristics of effective director

- **capacity for entrepreneurial leadership**
- **principle-centered**
- **high energy**
- **persistent**
- **disciplined with ability to stay focused**

There are some characteristics of an effective director that we have developed and defined as we have looked at this issue of successful incubators.

First of all, the director must have the capacity of entrepreneurial leadership. You cannot expect someone to work with a whole lot of entrepreneurial companies if they do not know what it is like to be entrepreneurial themselves. They should be principled centered. Very important that the director of the incubator understand the issues of values and principles of the development of a company so they can lead by example to the other companies in the incubators. Of course they should be high energy, just as an entrepreneur needs to be high energy. You have to focus and put all your energy into developing a start-up called an

incubator and in helping other companies become successful. So you also have to have the persistence and discipline in order to stay focused on what the end is because this is a long, hard row you have to hoe and the incubator director has to understand that it is going to take perseverance and determination to make that incubator successful.

DIRECTOR

Characteristics of effective director

- adaptable
- good communications skills
- ability to learn from mistakes
- business savvy

Likewise the director has to be adaptable, have good communications skills because you are teaching, you're sharing and helping the entrepreneur learn. You have to learn from your mistakes and we say last of all the person has to have business savvy - they have to understand how the business world works and operates. But we place that as a characteristic near the end of the list instead of the beginning because we believe these other characteristics are extremely important in terms of the director's profile.

7. FACILITY

Choose facility that enables incubator to sustain itself financially

- size
- condition
- maintenance
- flexibility/ up-sizing and down-sizing
- minimal environmental hazards

7th is the actual physical facility. Now a lot of people think that is the most important but we actually have it 7th on a scale of ten. We believe that you need to choose a facility that enables the incubator to sustain itself financially, and that has certain implications in terms of the size of the facility. That is: I) it should be probably 30,000 square feet or larger 2) you shouldn't have to do a lot of maintenance and repair 3) there should be a whole lot of flexibility in terms of being able to scale up if a lot more entrepreneurs want to move in - or if the entrepreneur wants to expand you need to have flexible walls and so forth. Likewise down-sizing if a lot of successful companies move out and then you have new companies move in and they need smaller space in which to locate. 4) and finally you need to find a place that has minimal environmental hazards as that can suck up a lot of your funds in the beginning.

8. USE OF DIRECTOR'S TIME

Minimize director's involvement in facility management and external relations

Maximize time spent working with companies in the incubator

The Director's most precious resource will be his or her time so you need to figure out how to minimize the amount of time the director has to spend managing the facility and on external relationships. That is why I said external relations was something the board needs to be worried about and maybe the facility management is something you could have a part-time person or maybe even an executive on loan to worry about and the executive director must maximize the time spent working with the companies in the incubators.

9. ASSISTANCE TO CLIENT COMPANIES

Develop portfolio of sophisticated techniques and services

Offer services to companies inside and outside the incubator

The best practice #9 has to do with the type of assistance the director will provide to client companies. We suggest that you develop a portfolio of sophisticated techniques and services - that is - there will be different kinds of services and different kinds of assistance for different companies, depending on their state and level of development. After you get the incubator up and running then you will be able to offer services not only to the companies inside the incubators but those on the outside so you can help them with the incubation process as well. That will be an important source of revenue in order to balance the bottom line of the incubator itself.

ASSISTANT TO CLIENT COMPANIES

Develop services that are clearly defined and differentially priced

The services that you develop need to be very clearly defined and they may need to be differentially priced. There may be a core of services you offer to everyone and then optional services depending on the stage of development or on the needs of the particular client company. But you need to thank that through carefully in developing this portfolio of services and have people understand what the cost is to tap into those services.

10. PURPOSE OF INCUBATOR

**Move companies from "long shot"
to "up and comers"
to "stars"**

And finally best practice #10 is to remember that the purpose of the incubator is to move companies who are coming in, who are on start up, where it is a long shot for them to be successful, move them up into the category where you would say "up and comers" and a few of them will move out and become "stars".

And so your services are designed to help companies move from one stage to another and therefore to help companies grow and develop to the point they can leave the incubator and be successful on their own.

I hope this has been helpful in terms of a summary in what we are seeing as best practices as you think about what your policies are in terms of developing incubators for your state or region.

Testimony Given to the
House Committee on Economic Development

September 27, 1993

Clyde C. Engert, President
Innovative Technology Enterprise Corporation

House Economic Development
September 27, 1993
Attachment 5

I appreciate this opportunity to present a brief insight on ITEC and the role it plays in the economic development picture.

As you know ITEC is a wholly-owned subsidiary of the Kansas Technology Enterprise Corporation (KTEC) and holds IRS tax code 501(c)(3) not-for-profit status. ITEC is guided by a 7-member board of directors. The board members are:

Ted Ayres - Legal Counsel, Board of Regents, Topeka
Kevin Carr - Vice-President, Kansas Technology Enterprise Corporation, Topeka
Clare Gustin - Director, Small Business Development Center, Fort Hays State University, Hays
Sage Joyner, Ph.D. - Adjunct Professor, Wichita State University and President, Kinetic Corp., Wichita
Lois Tully-Gerber - Manager, Technology Transfer, Kansas Electric Utilities Research Project, Topeka
George Dean - State Representative, District 96, Wichita

Slide #1

ITEC's stated mission is: "to assist innovators in the development and commercialization of marketable ideas in technology for Kansas".

A brief overview of how we see technology development will provide an understanding of how ITEC carries out this mission.

Taking a new technology through to successful completion is a difficult and complex process where no two journeys are the same. This journey becomes more difficult as patent costs rise, competition, business products and global marketing become more advanced.

Slide #2

The path to commercialization is filled with barriers and obstacles that must be overcome. Some of these obstacles are more difficult to climb than others. Obstacles include: financing, engineering knowledge, marketing data, business experience, manufacturing knowhow, packaging, distribution, patent protection, promotion, etc. No two technologies travel the same road and no two inventors have the same ability to overcome the objectives.

Slide #3

Commercializing an invention is not a go-it-alone situation! Innovators require different degrees and kinds of assistance. Sometimes ITEC's best work and one that seldom gets recognized is helping an inventor reach the conclusion to abandon an idea, thereby saving time and money to concentrate on another invention.

If we look at the goals behind ITEC's mission it become a little clearer what ITEC does. The Goals are:

Slide
#4

I. Provide quality education to inventors on the innovative process
II. Provide one-on-one counselling to inventors
III. Provide customized assistance in commercialization.

Slide
#5

Another viewpoint from which to gain an insight of the problem of technology commercialization is to review a typical technology development profile.

This chart illustrates the five phases all technology must go through to become successful. These phases are:

1. Concept development
2. Applied research
3. Start-up
4. Roll-out
5. Working capital

The risk in this undertaking are progressively eliminated as the technology is commercialized. You will notice the arena where ITEC operates is the highest risk, where both the invention and inventor are very fragile. It is this arena where the greatest potential for creating jobs can be found.

ITEC's first concerns when assisting an inventor is to try and answer these questions--

1. Is there a market?
2. Can the idea be developed?
3. Can a practical commercial plan be formulated?
4. Does the inventor have the knowledge and ability to manage the commercialization process?

You will notice that KTEC directly or indirectly touches the technology from creation to final commercialization.

Slide
#6
This chart illustrates the risk area that ITEC works in compared to later more developed efforts.

There is some merit to the argument that this "weeding out" of inventions is desirable and only the strongest will survive. Unfortunately, the factors responsible for the weeding out process do not serve in the best interest of the invention. Ignorance, lack of money, marginal business skills, fear, misplaced trust, gullibility, greed and other influences sidetrack good

practical ideas. Many times marginal ideas pushed by a motivated inventor consume time and money and fail late in the process.

A good invention in the hands of a poor manager will probably fail. The commercialization process makes little allowance for this. I believe it is possible to create a better "weeding out process" and will expand on this a little later.

Slide
#7

This sketch illustrates the amount of money and manpower ITEC can devote to its mission.

--Specifically what does ITEC do?

One way ITEC achieves its goals is creating and conducting three specialized seminars for a fee to cover expenses

Slide
#8

A brief word about these three seminars,

Invention Evaluation: $50.00 fee (includes materials)

This three-hour program is restricted to eight inventors, all of whom must sign a non-disclosure agreement. Following a lecture each inventor presents his/her invention to the group. The group in turn grades the idea on 40 key points. No names are recorded on these evaluations. Each question has five possible answers from a low -2 to a high +2 with 0 as an "I don't know" answer. Each inventor then plots the responses on a chart.

Slides
#9,10,11

From this exercise the inventor learns how others feel about their ideas and the degree of concern other inventors have. We then provide guidance on the significance of each question, discuss grouping of answers and give a list of "Danger" questions that can impede any invention. From this the inventor is able focus on specific areas where help may be needed, what is required, and how solutions may be found.

Marketing Seminar: $35.00 fee (includes materials)

This three-hour seminar is available to anyone interested in marketing an idea or invention. Subjects covered include determining benefits of the idea to the consumer, who and how others can make money, how to conduct market surveys, what is the competition, how to price, etc. Each participant leaves with a draft of a marketing development plan and a method for determining the market potential for the invention.

Invention Development: $75.00 fee (includes materials & lunch)

This eight-hour workshop is restricted to 8 inventors who must sign a non-disclosure agreement. This is a working seminar where individual assistance is given each participant in developing a commercialization plan including licensing for a royalty. Many of the topics in the other two seminars are expanded in this workshop.

-- ITEC conducts public speaking sessions and free 3-hour seminars several times a year at Washburn University on copyright, trademarks and patents.

-- ITEC provides one-on-one counselling with inventors.

-- In association with Washburn University, assistance in patent searches and commercialization efforts is provided at little or no cost to the inventor.

-- Direct involvement with a technology is done on occasion where it is in the best interest of both parties.

-- ITEC conceived and established a volunteer driven "Wizard" program for elementary school children where problem solving skills are enhanced. To date 144 Gifted Special Education children have taken part in the program. This program is being expanded through a volunteer network.

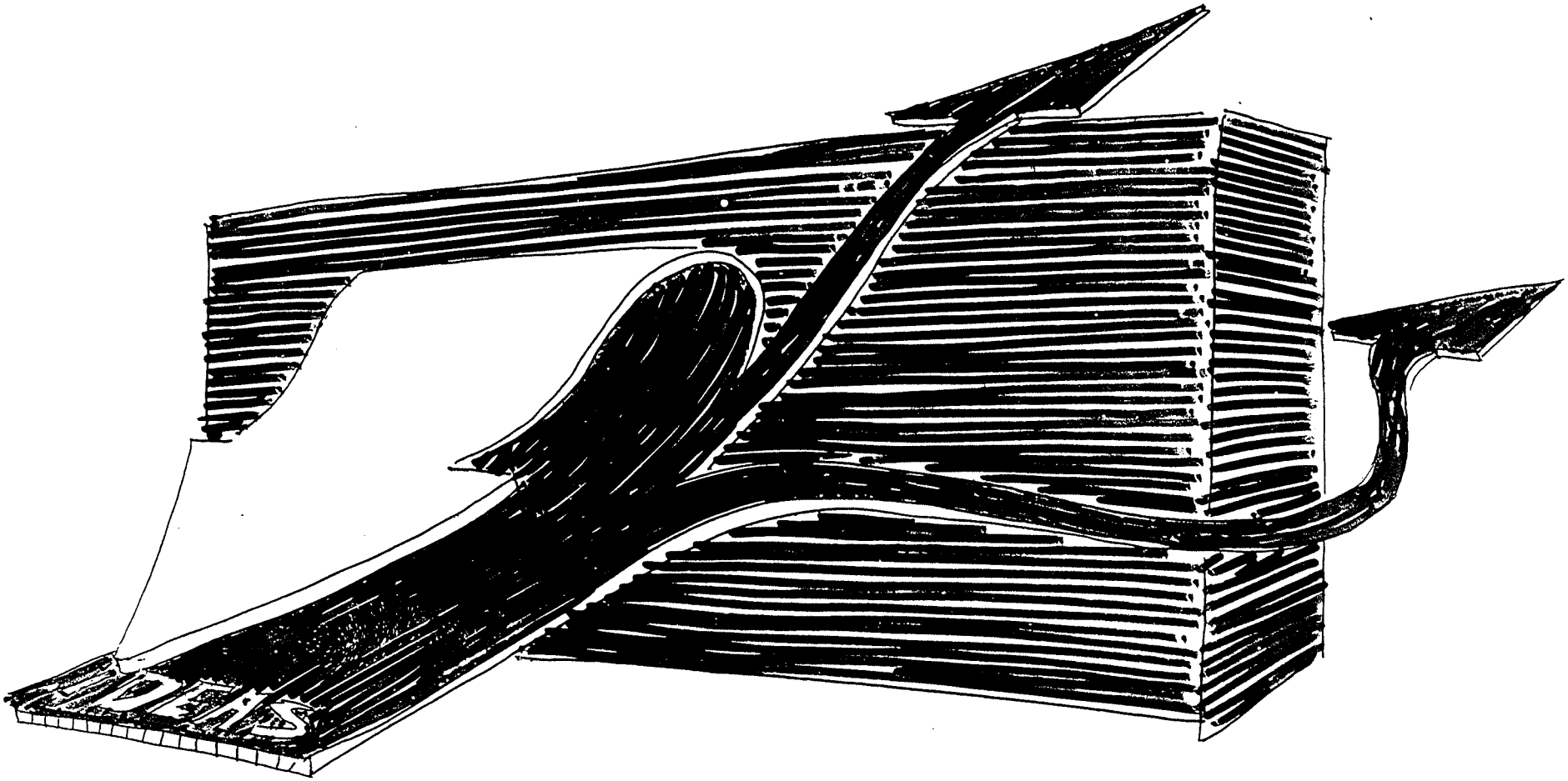
Slide #12

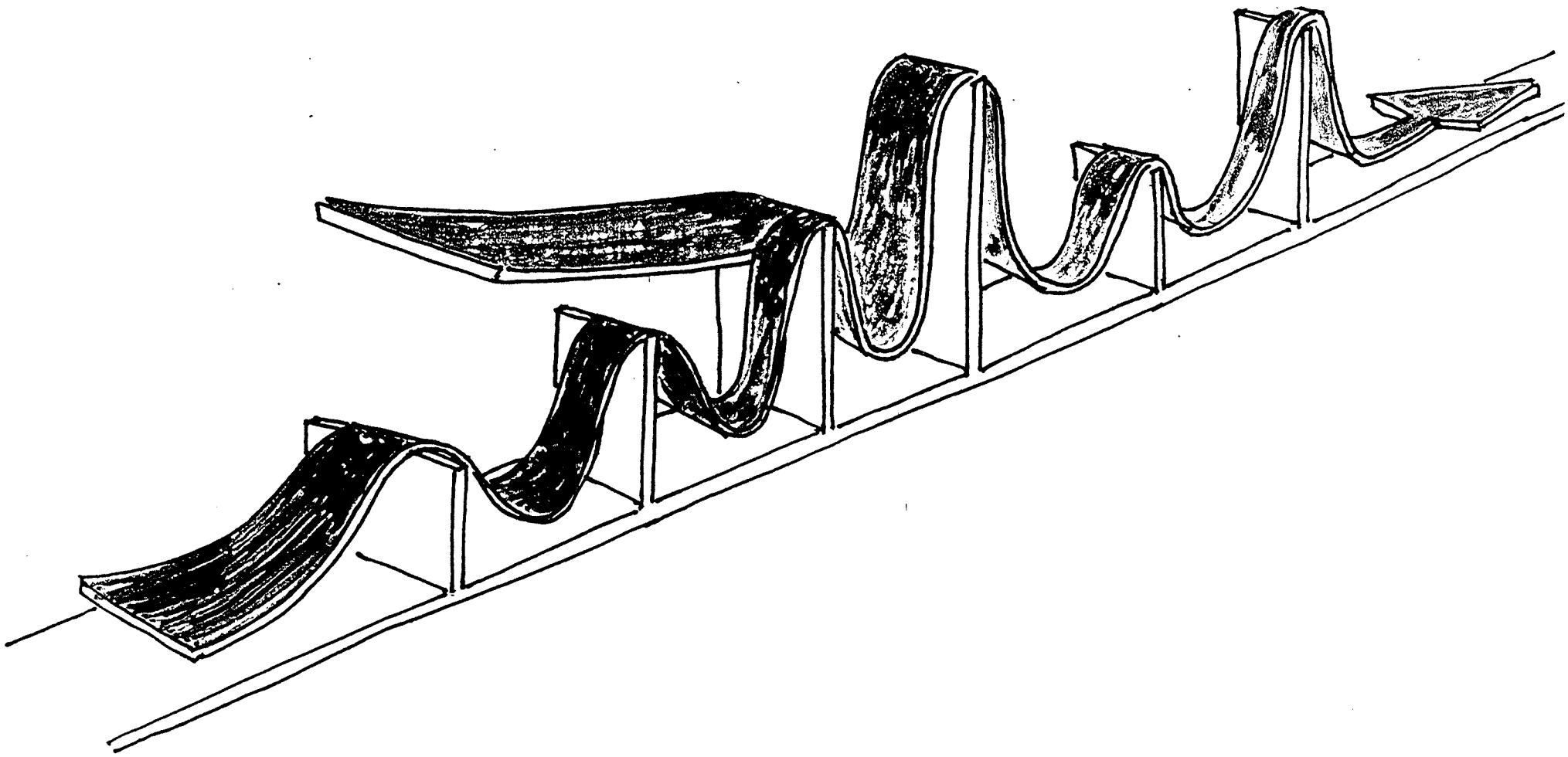
-- A consortium of manufacturers, investors, marketers and inventors is being formed by ITEC that will assist promising inventions the opportunity of being commercialized in Kansas. Donations to formulate this concept have been received from Southwestern Bell, Shawnee County Economic Development, a private manufacturer and ITEC. Others have pledged contributions. This business, when operational, will be a membership company owned by the members and operated under a board of directors, will attract technologies from within and outside Kansas. The objective is to increase the odds of success for commercializing promising technologies and create jobs in Kansas.

It is my personal belief that the current 2% success rate for commercialization of inventions is not a valid basis for judging the commercialization potential for inventions. I believe it indicates the failure of traditional methods of inventor development is not working and new innovative ways to improve the success rate are needed. I believe your continued support for ITEC will allow us the tools to effect some changes in this vital area.

ITEC MISSION

"ASSIST INNOVATORS IN THE DEVELOPMENT
AND
COMMERCIALIZATION OF MARKETABLE IDEAS
IN
TECHNOLOGY FOR KANSAS"





C.E. 5-12-90 3

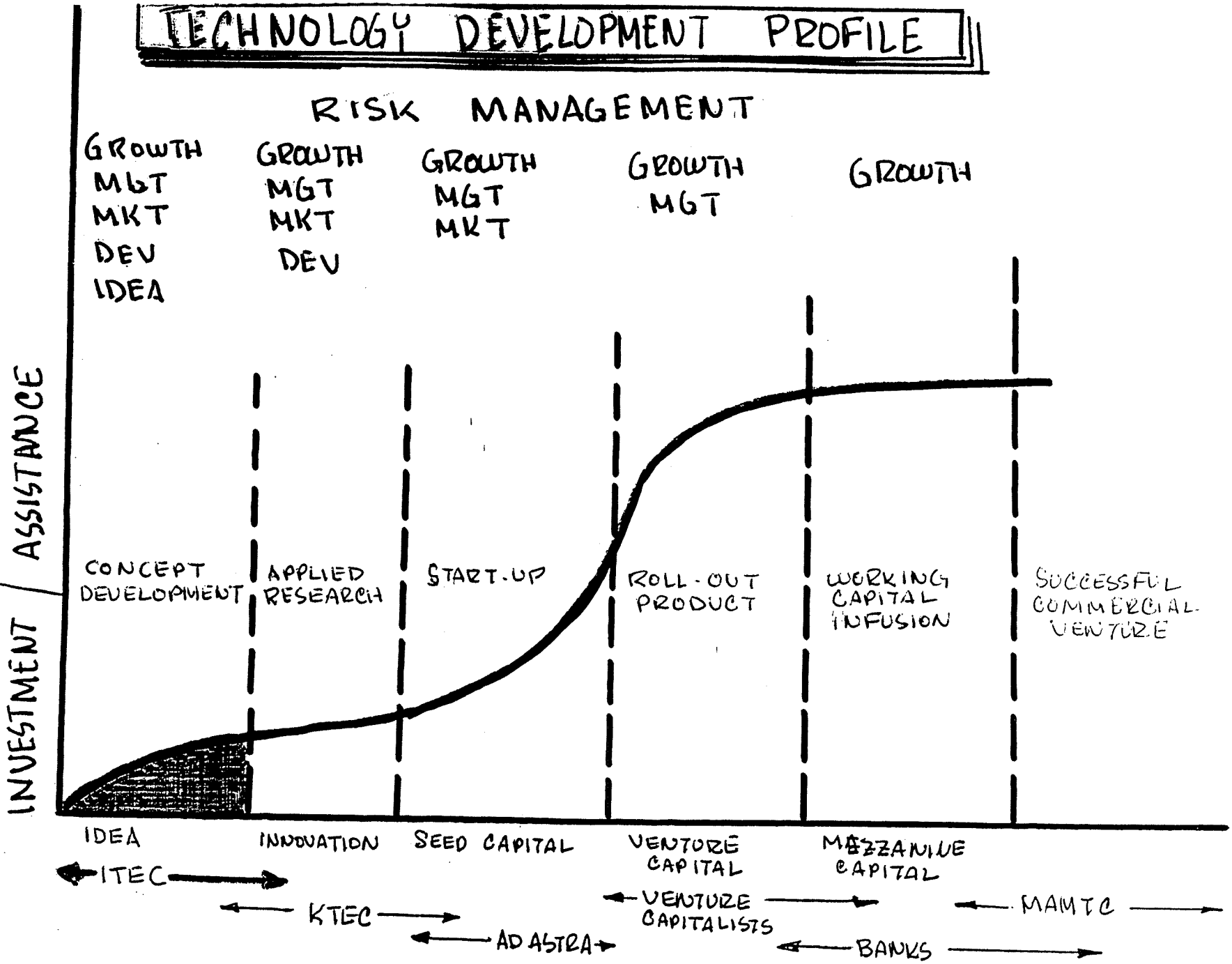
THREE PRIMARY GOALS:

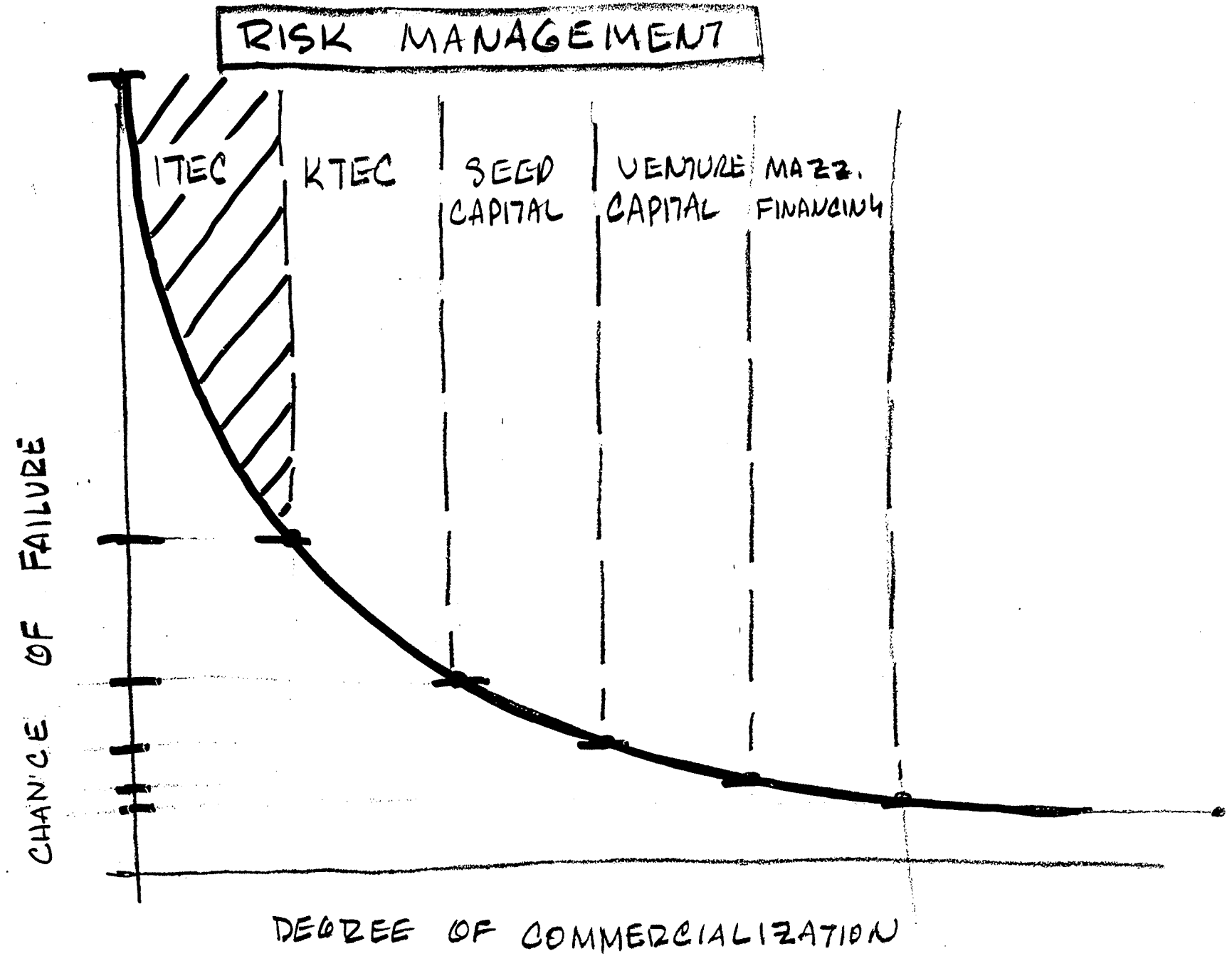
I. PROVIDE QUALITY EDUCATION TO INVENTORS ON THE INNOVATIVE PROCESS

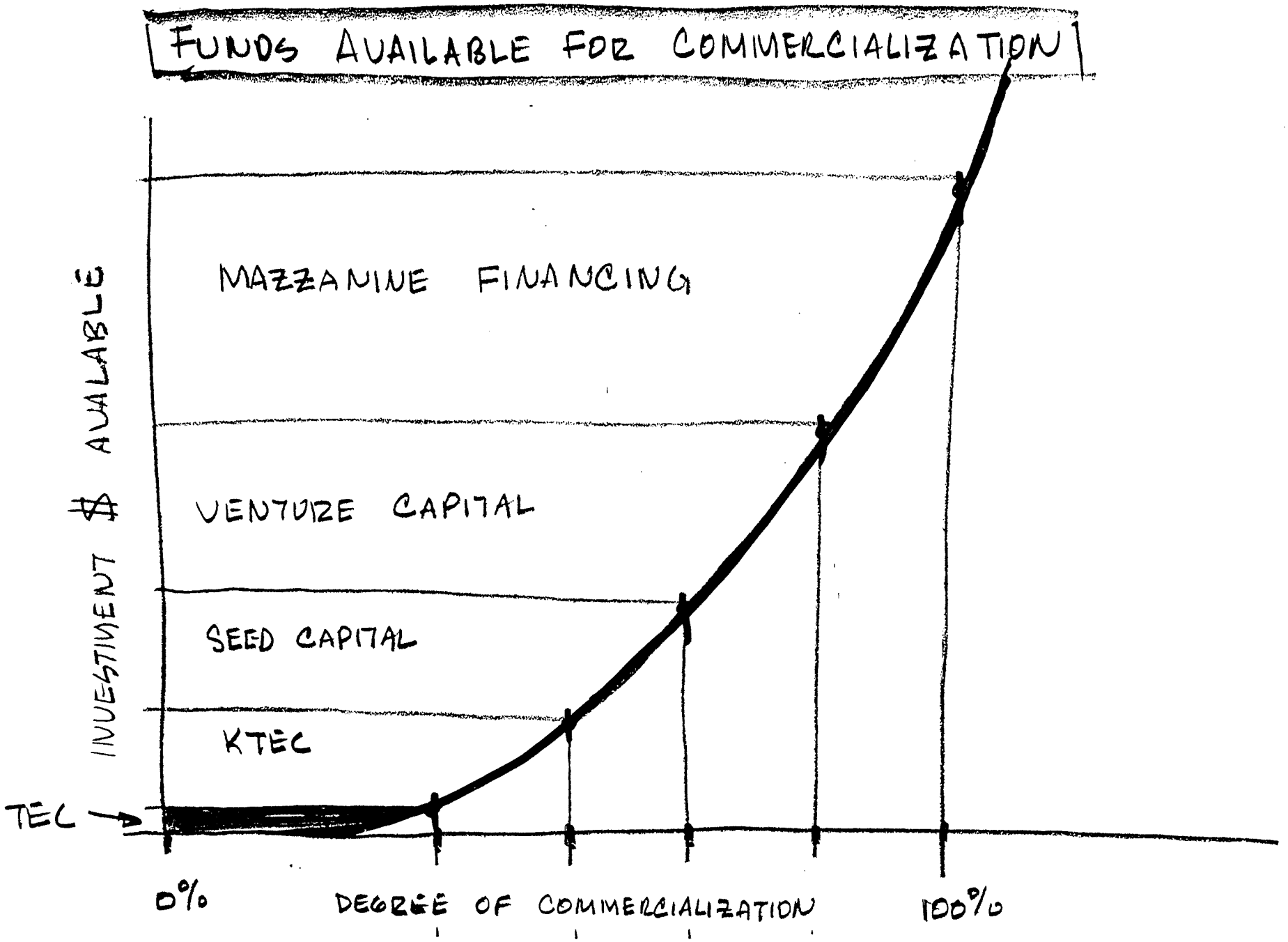
II. PROVIDE ONE-TO-ONE COUNSELING TO INVENTORS

III. PROVIDE CUSTOMIZED ASSISTANCE IN COMMERCIALIZATION

TECHNOLOGY DEVELOPMENT PROFILE




RISK MANAGEMENT
ITEC
KTEC
SEED CAPITAL
VENTURE CAPITAL
MAZZ. FINANCING
CHANCE OF FAILURE
DEGREE OF COMMERCIALIZATION


FUNDS AVAILABLE FOR COMMERCIALIZATION
MAZZANINE FINANCING
VENTUIZE CAPITAL
SEED CAPITAL
KTEC
TEC
INVESTMENT $ AVAILABLE
0%
DEGREE OF COMMERCIALIZATION
100%

ITEC's

Invention Evaluation Program

A Unique Program for the Serious Inventor

ITEC INNOVATIVE TECHNOLOGY ENTERPRISE CORPORATION
112 West Sixth, Suite 408, Topeka, KS 66603

ITEC

Marketi

Worksl

A Practical Program for Successful Marketing

December, 1992

ITEC INNOVATIVE TECHNOLOGY ENTERPRISE CORPORATION
112 West Sixth, Suite 408, Topeka, KS 66603 (913) 233-9102 FAX (913) 296-1160

The Successful Inventor's Workbook

A Manual for the Serious Inventor

The How-to Guide for Successfully Developing Your Invention

Innovative Technology Enterprise Corporation
112 W. 6th St, Suite 400
Topeka, KS 66603

8

Place an "x" next to
reaction to the inve
plete the evaluatior
come back to it if ti
not know."

1. Need: The ne

____(-2) Very lo
____(-1) Low - s
____(0) Do not
____(+1) Mode
____(+2) High

2. Comparison:

____(-2) Worse
____(-1) About
____(0) Do not
____(+1) Bett
____(+2) Sup

3. Competition:

____(-2) High
____(-1) Avera
____(0) Do no
____(+1) Littl
____(+2) Non

**4. Feasibility: **

____(-2) No
____(-1) Yes -
____(0) Do nc
____(+1) Yes
____(+2) Yes

5. Production:

____(-2) Imp
____(-1) Diffi
____(0) Do n
____(+1) Qu
____(+2) Ve

18. Development:

____(-2) Idea sta
____(-1) Rough p
____(0) Do not k
____(+1) Final p
____(+2) Market

19. Research: To will be:

____(-2) Excessi
____(-1) Moderat
____(0) Do not k
____(+1) Very n
____(+2) Very s

20. Investment: -

____(-2) Excessi
____(-1) Heavy -
____(0) Do not k
____(+1) Model
____(+2) Low -

21. Materials: Av

____(-2) Difficult
____(-1) Limited
____(0) Do not k
____(+1) Readi
____(+2) Availa

22. Service: The

____(-2) Very hi
____(-1) High -
____(0) Do not
____(+1) Mode
____(+2) Low -

23. Quality: To |

____(-2) Difficu
____(-1) Close
____(0) Do not
____(+1) Mod
____(+2) Low

24. Product life: T

____(-2) 1 to 2 yea
____(-1) 2 to 5 yea
____(0) Do not kno
____(+1) 5-10 yea
____(+2) More tha

25. Potential: The

____(-2) Very small
____(-1) Small
____(0) Do not kno
____(+1) Medium
____(+2) Large

26. Acceptance: T

____(-2) Very low -
____(-1) Low
____(0) Do not kno
____(+1) Moderat
____(+2) High - wi

27. Demand: The

____(-2) Declining
____(-1) Steady
____(0) Do not kno
____(+1) Growing
____(+2) Growing

28. Distribution: T

____(-2) Very high
____(-1) Medium -
____(0) Do not kn
____(+1) Low - e
____(+2) Very lov

29. Competition:

____(-2) Very high
____(-1) High
____(0) Do not kn
____(+1) Modera
____(+2) Low

36. Presentation: The inventor's pre

____(-2) Poor - I was provided no informa
____(-1) Fair - the inventor provided most
____(0) Do not know
____(+1) Good - Nearly all my questions
____(+2) Very Good - I had no questions

37. Communication: The inventor's

____(-2) Poor - I had trouble understandi
____(-1) Fair - there were some rough sp
____(0) Do not know
____(+1) Good - the inventor did a gooc
____(+2) Very Good - the inventor really

38. Credibility: How would you rat

____(-2) Very bad - the inventor came ac
____(-1) Poor - I questioned the logic of
____(0) Do not know
____(+1) Fair - the inventor was realistic
____(+2) Good - I have no doubts abou

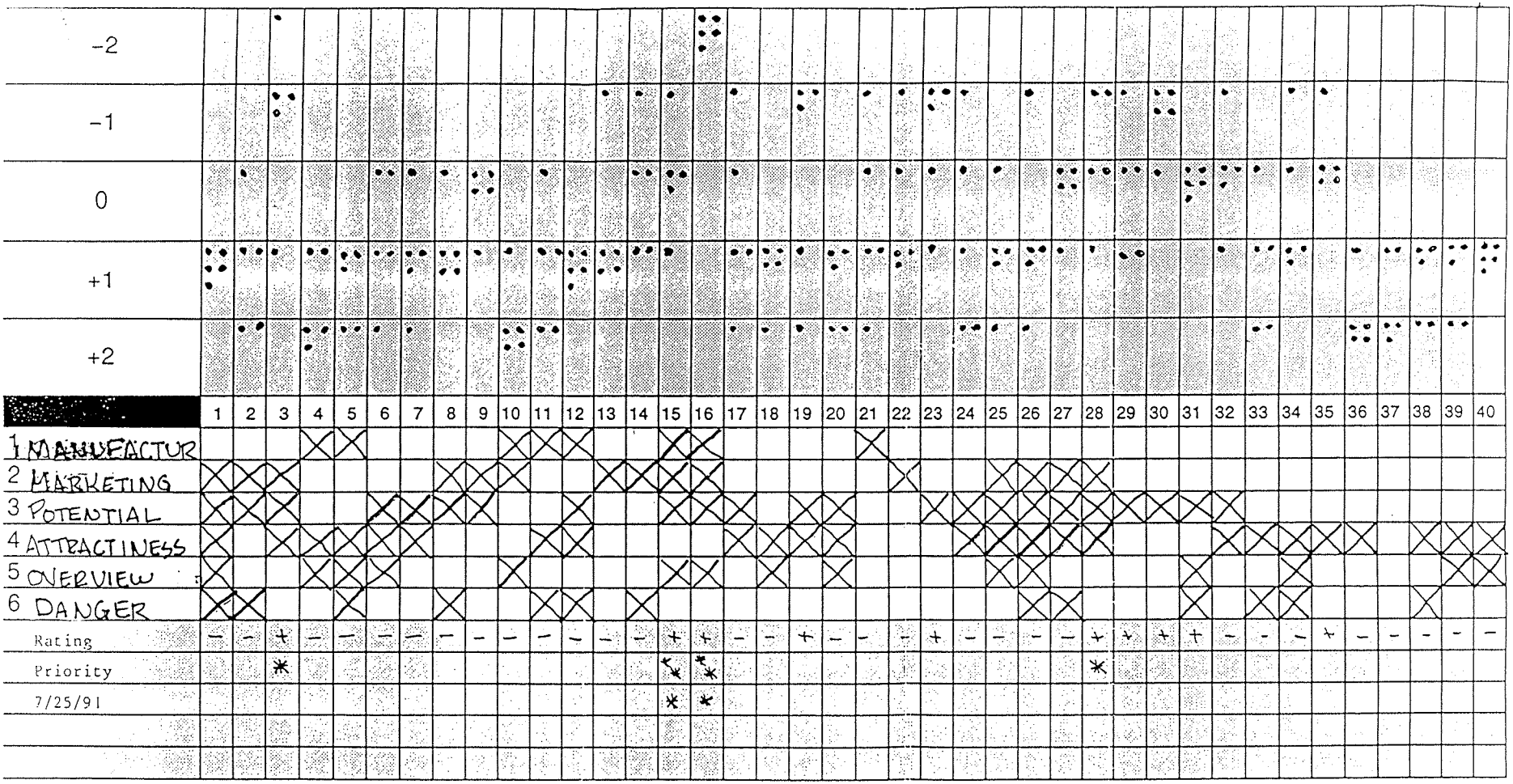
**39. Organization: How organized **

____(-2) Not very organized - never real
____(-1) Reasonably well organized - gc
____(0) Do not know
____(+1) Well organized - had only a fe
____(+2) Extremely well organized - nc

40. Business skills: The inventor's

____(-2) Poor - I doubt he/she could ru
____(-1) Fair - the inventor seems to ha
____(0) Do not know
____(+1) Good - with a little help, the i
____(+2) Very good - I have no doubt

ITEC's Invention Evaluation



(3) Can your product meet standards?

F. State briefly your concepts for follow-on (next generation) products.

G. Provide the status of protection of your invention (i.e. disclosure, patent pending, etc.)

4. Manufacturing Plan

A. How will the product be made?

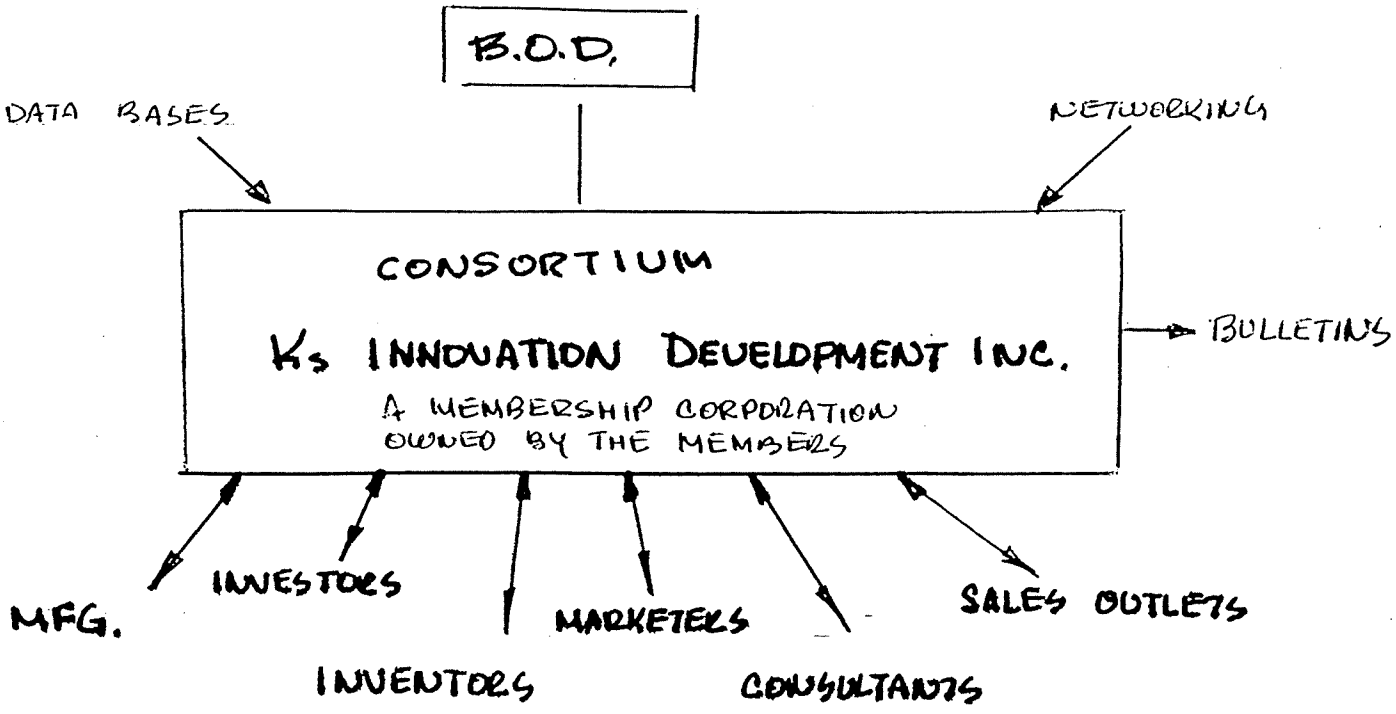
(1) What tooling is required?

(2) Of what material will it be made? Why?

(3) What equipment is required to make it?

B. Who will make the product?

(1) If you plan to set up a manufacturing facility, what are your qualifications to do so?



- EACH MEMBER HAS ONE SHARE VOTING STOCK
- MANAGED BY SMALL STAFF & ADVISORY BOARDS
- SUPPORTED BY DUES & ROYALTIES
- OPERATED BY RFP'S & PERFORMANCE

BENEFITS

INVESTORS	REDUCES ODDS OF FAILURE - CAN INVEST IN SEVERAL OR ONE TECHNOLOGY
INVENTORS	PROVIDES AN ALTERNATE WAY TO COMMERCIALIZE IDEA FOR A ROYALTY
MFG - ETC	GAIN ACCESS TO NEW BUSINESS

CREATE NEW JOBS IN KANSAS

Strategies for Marketing High Tech Products and Processes

The title "Strategies for Marketing High Tech Products" can be compared in variation and complexity to the subject " How to Catch Fish". Reams of studies, thousands of books, and countless articles have addressed both of these subjects. What it generally boils down to is the conditions at the time, the equipment you have to work with, and the help of a guide to show you where to get started.

One soon learns that commercialization is a word that encompasses the entire process for identifying, designing, refining, and marketing any new product. Before that new product is on the market, the final stages of commercialization, customer identification, may prove to be more difficult than the actual designing and development of the item.

With larger companies such as Boeing or Cessna, the introduction of a new innovation, even if the product is totally unrelated to their industry, is only a phone call away. Their experience, prestige and resources command attention. When their representative calls, someone is always ready to listen. However, for a small company, let alone the entrepreneur and their new company, the challenge of recognition and assistance can seem impossible.

Therefore I will concentrate my remarks and recommendation on how small and/or startup companies can be assisted from dependency to profit making, tax paying, employers, allowing them to contribute in a positive manner to Kansas's future economy.

Kansas has done well in recent years through KTEC, the Universities, the Department of Commerce and MAMTC in pinpointing and supporting up and coming firms and products. But with the complexity of today's market place we must move to the next level of help by providing regional informational centers consisting of legal, technical, managerial, financial, and marketing specialists.

As I proceed on with my remarks you will hear over and over again the importance of reliable precise information that the entrepreneur can depend on.

The inventor is a specialist in his or her field, but very soon they will learn they need help in locating information on patents and patent searches. Finding the regulations necessary to comply to federal and state statutes, technical and physical assistance in prototype development, forming alliances with manufactures for production, seeking financing or capitol investment, targeting the product's consumers, planning the necessary promotion and advertising, and the list goes on.

House Economic Development
September 27, 1993
Attachment 6

What each and every inventor and/or small company will need eventually is affordable informational support that is centrally located, easily assessable, administered by individuals that are honestly interested in the achievement of a successful venture. At times that means constructive criticism and even the recommendation that the idea or product be scrapped because it is already being done, there is a better less expensive way, or there is a more practical solution to completing the task. An example would be the many proposed devices for stopping car theft and armed carjacking. I have seen proposals for locking up transmissions, disabling drive shafts, or permanently setting the breaks. All of these systems will work. However, they all require major expensive mechanical modification. While on the market today are simple inexpensive electrical devises that will disable the cars electrical system, they have delayed activation, are radio remote controlled, and are easily installed, and represent a better solution in almost every case. In order to save the time and money pursuing a questionable product, the inventor deserves access to a sincere opinion from a respected knowledgeable professional.

Once the decision has been made that the product has commercialization possibilities then the tough work begins. This is the stage of development that the inventor finds most difficult. The inventors are without a doubt experts in their field of endeavor, but they are now required to enter unfamiliar and uncharted territories. In some instances the inventor expects customers to beat a path to his door, when this doesn't happen, many times they become demoralized and lack the perseverance to continue. However, in most situations the entrepreneur realizes that the world must be sold on the product and that they can not effectively guide their product through the maze of requirements without subsidized support or a very substantial personal budget.

Soon the realities set in that the hard work is not over, it is only focused in different direction. The first stage of commercialization begins by actually identifying the item we have to market. Are we dealing with a intellectual properties only? Such as courses in management study, personnel management, hazardous waste handling, or educational instruction in the latest laws governing workplace safety. But more likely than not the inventor will have a physical product. It may be a software program or a mechanical or electrical devise or a combination of all three. This is an additional time for the independent specialist to step forward and analyze the product and suggest the course of action for product refinement, before the last of stage of commercialization, customer identification and sales.

Remember each inventor views their product as a brain child. This advisor must have the experience, knowledge, and the respect of the inventor, because it takes a lot of courage and self assurance to tell a parent that their child needs a lot of plastic surgery before their coming out party.

We now believe the product has merit and could be commercially successful. Our next stop is with the legal aspects of the devise. Will the devise infringe on someone else's patents? Is this devise patentable or would it be better to seek uniqueness by a copywriter or a trademark? Have all state and federal regulations been checked for compliance?

Should an independent laboratory perform a series of tests to assure conformity? With a high tech product almost invariably a number of the above items will need to be addressed, all of them requiring specialized assistance and most of them expensive.

I would like to acquaint you with an example of the progress Kansas has made in new product support. Six years ago ICE developed a sophisticated microprocessor controlled deicing system for British Aero Space Ltd. After completion, ICE was required to submit the unit to a battery of environmental test. All of the test were performed at the closest location Acton, Massachusetts, at an actual cost of $27,000 plus engineering travel. Should those same tests need to be performed today, many of them could take place in Kansas at the National Institute for Aeronautical Research located at Wichita State University.

The basics have now been completed, we have successfully identified the product, protected it from infringement, and we can speak intelligently on what improvements must be made before commercialization. Again the experts must advise us on how and what are the best and most profitable methods of commercialization for this product and situation. Should you try to sell the patent rights for a one time influx of money? Would it make more sense to license the technologies entirely to one company or to a number of companies each in unrelated industries for a smaller one time licensing fee and a percent of the sales? Maybe the right action is to form a joint venture with an existing firm that could provide some financing, product development, manufacturing, and marketing. Lastly, is it feasible for you to be the master of you own domain? Can you start and run your own company providing all of the above services. Again I must reiterate, that in order to make an intelligent decision you must have experienced, trustworthy and affordable guidance through this entire process.

With the product perfected, protected and the prospective market identified, how soon can you expect your plan to reap rewards? Well the old adage of "It's not what you know but who you know" will certainly come to bear in this situation. Presumably the inventor was working simultaneously with all the specialists required to bring this product to market. By the time the physical problems have been solved we should also have in our business plan the names of prospective customers. How will a Kansas company be received and accepted for it's technical expertise? I can only relay some of my personal experiences on this subject.

In 1990 the ICE Corporation won a $50,000 Phase I SBIR (small business innovative research award) for the development of a high power hybrid switch. The Phase I requirements states that you must prove technically that your theory will work in practice. This is normally done by providing test bench documentation on experiments that were run and submitting the results. However, as I discussed the interim reports with the contract engineer over the telephone, I detected an uncomfortable and even a skeptical tone in his voice. At a internal meeting with the ICE engineers the decision was made to go one step further than the requirements and actually produce working prototypes. After searching Kansas for a supplier we found it necessary to contract the assembly with a California Silicon Valley company.

The switch rated for 5 amps at 25 volts was manufactured, worked as expected, and five prototypes were submitted along with the written documentation, thus successfully completing Phase I.

A Phase II proposal was then written for $475,000 in order to expand the capabilities of the switch to 100 amps at 400 volts. A large percent of the $475,000 was for equipment so the project could be done totally in Kansas. The lead ICE engineer Dr. Dawes and I were summoned to Fort Belvior VA just out side of Washington DC. At this meeting were seven or eight of the government's top engineers on power distribution and heat management and a representative of a Government lab. We learned at this meeting that the Department of the Army had spent over $70,000 at the Government lab, testing our switch (remember our Phase I contract that manufactured the switches was for only $50,000) just to be certain that our report was correct. The group tried to persuade us to do Phase II with the help of an outside assembly house rather than doing it in Kansas. We held our position. Finally we were told to our faces that if this project was going to take place in the New England tech centers or in Silicon Valley they wouldn't be surprised or concerned, But Kansas? We left the meeting and came home not knowing if we were to get the award or not. Now in 1993 I can report to you that we got the contract and successfully completed the 100 amp switch in Kansas and we have applied for a patent and are preparing our marketing strategies.

My next and last example is much shorter. ICE is a certified supplier of United Technologies, a Fortune Five Hundred Company with over 10,000 suppliers nation wide. These approved companies are supplying every type of product imaginable. In order for Kansas companies to be participating equally with the other states we should have about 200 suppliers in Kansas. But out of the 10,000 there are only two suppliers in our state. Kansas's technologies and their innovative companies unfortunately are one of the best kept national secrets since the A bomb.

The best marketing plan in the world won't be successful if you can't get the ear of the consumer. With high tech products your consumer is generally a larger company or a government agency that will utilize your invention within their product. That makes it imperative that you have name recognition in order to establish primary contact. The only way small companies can achieve that recognition is by association. On KETC's development list is the answer to instant name recognition. The evolution of regional Innovation and Commercialization Centers. These proposed centers would provide the atmosphere of excellence in product development by providing all the necessary business and engineering support required to produce a superior product. Not only would these Innovation centers assist our inventors in world wide contacts, but the centers would act as a magnet attracting out of state companies that see the advantage of association with such a powerful and diversified brain trust.

Kansas will always be recognized for their farms and waving fields of wheat, and rightly so. But Kansas is also growing manufacturing cores and the young minds it takes to run them.

For years we have trained and educated our sons and daughters only to export their knowledge and work ethics for other states to profit from. I believe the time is now to capitalize on the changing economic times and the migration of business from the coasts. Kansas has all of the ingredients, land, quality of life, work ethics, excellent higher educational facilities, and a head start on other states with our Commercialization Centers. We must continue to support the entrepreneur's new businesses and the jobs they will create. By concentrating our efforts and resources today we can continue to cultivate the opportunities for tomorrow.

Prepared by:

Patrick Connelly, President
ICE Corporation
Manhattan, Kansas

Part Number Log
Purpose

The Part Number Log (PNL) is used to cross reference ICE part numbers with customer part numbers. It also keeps track of both the ICE and the customer part revision letter. This Part Number Log (PNL) contains two lists of numbers. One is the ICE to Customer PNL and the other is the Customer to ICE PNL. The ICE to Customer PNL contains a numeric list of ALL ICE part numbers on file. The Customer to ICE PNL contains a list of customer part numbers grouped according to customer. (DO NOT try to determine an ICE part number from a customer part number using the ICE to Customer PNL or vice versa.)

Instructions

Additions or changes to this log may only be done with an Engineering Change Notice (ECN). When design begins on a new product or test jig; when a quote to manufacture a new part is done; or when a piece of equipment is to be identifyed by the ICE part numbering sytem, an ICE part number will be issued to that product and the new ICE part number will be added to the ICE to Customer PNL (See section 6.3.1 of the Drafting Room Manual for instructions on assigning part numbers). All part numbers will also be added to the Customer to ICE PNL except those that are for ICE internal use only (e.g. Test Jigs). When a new design is added to the Customer to ICE PNL that has the same customer part number as a product currently being produced by ICE, the phrase "Design In Progress" must appear in the description. The phrase "Design In Progress" will stay in the description until that product is ready for production, at which time the old part with the same customer part number must be obsoleted. If a part is obsolete it WILL be stated in the part description along with the part number of the part it was replaced by.

For the ICE to Customer PNL insert the following information:

1. ICE part number in numeric order
2. ICE part revision
3. Eng. disk number which contains info on this part
4. Customer part number
5. Customer part revision
6. Two letter customer abbreviation
7. Part description

For the Customer to ICE PNL insert the following information:

1. Two letter customer abbreviation in alphabetical order
2. Customer part number in numeric order
3. Customer part revision
4. ICE part number
5. ICE part revision
6. Part description

A list of customer two letter abbreviations appears on the last page of this document.

QAF-13 Rev: CW

Part Number Log
ICE to Customer Numbers

ICE PN	Rev	Disk	Customer P/N	Rev	Cust	Description
311-1	A	014	9910412-1	B1	CA	Temperature Control
311-2	A	014	ES62117-1	A	KP	Temperature Control
313-1	NC	014	9914026-1	NC	CA	Windshield Temp. Cont.
319-1	NC	019	F7-51-3	C	PH	Cabin Heat Controller
319-2	NC	019	F7-51-5	C	PH	Cabin Heat Controller
413-1	NC	023	9910285-1	A8	CA	(Obsolete)-see 913-2
413-2	NC	023	C165022-0102	C	CA	Surface Deicer
414-1	F	011	774934-1	D	HS	Prop Deicer
414-2	C	011	790219-1	B	HS	Prop Deicer
414-3	NC	011	774478-1	B	HS	Prop Deicer
415	A	024	C165022-0101	B	CA	Surface Deicer
450-1	B	030	792113-1	NC	HS	Prop Deicer
450-2	NC	030	792113-1	A	HS	Prop Deicer
514-1	NC	023	PO72575-01		CA	Prop Deicer
514-2	NC	023	PO72575-02		CA	Prop Deicer
514-3	NC	023	C165020-0201	B	CA	Prop Deicer
761	NC	023	76-1AA		CA	(Obsolete)-see 913-1
811	E	020	101-384175-1	C	BA	Inverter Monitor
851-1	E	016	790112-5	B	HS	ATP Prop deicer
851-2	NC	016	790112-4	E	HS	ATP Prop deicer
852-1	NC	013	A27231272-10	D	PH	Temperature Controllers
852-2	NC	013	A27231272-11	D	PH	" "
852-3	NC	013	A27231272-12	D	PH	" "
852-4	NC	013	A27231272-13	D	PH	" "
852-5	NC	013	A27231272-14	C	PH	" "
852-6	NC	013	A27231272-25	B	PH	" "
852-7	NC	013	A27231272-20	A	PH	" "
852-8	NC	013	A27231272-20A	A	PH	" "
853					DL	3-Minute Timer
854	B	009	8305336-80	HF	DL	IDU board
855		009			DL	RTMS Feeder
856	NC	010	8304807-80		DL	Y Master Memory mod
857	C	010	8304900-81	G.9	DL	Yieldmaster Board
858	NC	007				859 Test jig
859	A	007	C166065-0101	C	CA	Windshield Deice
861	NC	009			DL	Multitask 4 Timer
862	A	015	700707060	B	HF	Speedometer
863	E	012	DA25001	NC	GT	Grain Dryer Control
864	C	010	8305521-81	G.9	DL	Portal IDU mem mod
865	NC	026				ARINC Simulator
866	NC	026				MC68705P/R/U Programmer
867	NC	026				414/450 Dielectric T.J.
868	NC	025			TC	Spore sampler timer
869-1	NC	009	8304463		DL	Stall Unit
869-2	NC	009	8305426		DL	Antenna Interface Unit
871	B	027	DA25002	NC	GT	Continuous Batch Dryer
872	NC	026				Oscilloscope Calibrate
873	NC	026				35V/6A DC power supply
874	NC	026			DL	856 & 864 Test Jig

Part Number Log
ICE to Customer Numbers

ICE PN	Rev	Disk	Customer P/N	Rev	Cust	Description
875	C	015	700709699		HC	Baler Solenoid driver
876	A	027	DA25010	NC	GT	12 Volt DC Supply
877-1	NC	032			GT	871 Emulator
877-2	NC	026			GT	871 Test Jig
878	NC	023			CA	Boot Deice
879	NC	024	C165020-0101			2 Phase Prop Deice
881	NC					Light Timer
882	NC	026				8610 Chime Test Jig
883	NC				BA	Stabilizer Deice Timer
884	NC	027			GT	Igniter
885	A	032	DA25003	NC	GT	Continuous Flow Dryer
886	NC	026				878 Test Jig
887	NC	018	8305265-81	NC	DL	Stall take-off unit
888	NC	035				Deer Horn
889	NC	027			GT	Temperature Probe
891	NC	034				413, 761, & 913 Test Jig
892	A	027	77367	NC	GT	Controller
893	NC				RW	Surface Deice Controller
894	NC	002			BM	Infrared Video Simulator
895	NC	035	1E19-1		PH	Deice Controller
896	NC	024	9910380-1	NC	CA	Propeller Deice Timer
897	NC		C593005	NC	CA	Overvoltage Sensor
898	NC	033		NC	AP	Fish Scale
899	NC	025	139-02E		PH	852 Test Jig
901	NC	034				514-1,-2,-3,879 Test Jig
902	NC				KS	KSU Grid Plane
903	NC					(Obsolete)-see 9118
904	NC	038	800117	NC	ED	V4A Module Driver
905	NC				US	Hybrid Switch
906	NC	042				8914 Test Jig
907	NC	018	PM-200		MX	HSC Programer
908	NC	041			VM	Corn Picker Control
909	NC	018	F7-6-3		PH	Recycle Control
911	NC	026				9017 TEST JIG
912-1	NC	009	8305892-80		DL	Green Stall Unit
912-2	NC	009	8305892-83		DL	Red Stall Unit
912-3	NC	009	8306001-01		DL	Ant. Int. Unit Green
912-4	NC	009	8305898		DL	Ant. Int. Unit Green
913-1	NC	046	76-1AA		CA	Boot Deice Timer
913-2	NC	046	9910285-1	A8	CA	Boot Deice Timer
914	NC	029				Gage Block Set
915	NC					912 Test Jig
916	NC	026				912-3 Test Jig
917	NC	025			PL	24 to 12 Volt Converter
918	NC	038			VM	Bale Wrap Counter
919	NC	009			DL	SST II V6.0
921	NC	049	985317-80		DL	Milk Meter
922	NC	050			DB	Electro-Ejaculator Chord
923	NC	050			DB	Electro-Ejaculator Probe

Part Number Log
ICE to Customer Numbers

ICE PN	Rev	Disk	Customer P/N	Rev	Cust	Description
924	NC	020				Low Current Timer
925	NC	051			EV	Meter
926	NC	050			DB	Semen Collection Handle
927	NC	043			VM	9017 Enclosure w/o holes
928	NC	010	8306380-80		DL	PM5000 Plug-in Card
929	NC					852 Test Jig
931	NC				DL	9220 Test Jig
932	NC				KP	Cabin Temperature Control
933	NC				DB	922 & 923 Test Jig
934	NC				DB	9122 Test Jig
935	NC				KP	932 Test Jig
936	NC		8306042-80		DL	SST 6.0
937	NC				DB	Ejaculator - Krusberg
938	NC				DD	Profile O'Graph
939	NC				MM	Quad I/O Board
8610-1	NC	020	101-384138-1	A	BA	New Chime w/o trigger
8610-2	NC	020	911E	NC	CA	New Chime with trigger
8611	NC	008	560655		HS	8 Phase Timer
8612	NC	020	101-384175-1		BA	New Power Monitor
8613	NC	026			HS	414-450 Universal
8614	D	026				851 Test Jig
8615	NC	009			DL	854 Test Jig
8616-1	NC	026			GT	863 Emulator
8616-2	NC	026			GT	863 Test jig
8710	NC					MIL-704 Test Jig
8711	NC	027	DA25020	NC	GT	DC Motor Controller
8712	NC	026				876 Test Jig
8713	NC	026				313-1 Test Jig
8714	NC	031			US	Power Switch
8715	NC	026				862 Test Jig
8810	NC	014	8810	NC	CA	Light Timer
8811	NC	025			CM	Controller
8812	NC	014				8810 Test Jig
8813	NC	025				884 Test Jig
8814	NC	025				Wavetek Calibrate
8815	NC	025		4	WR	Fluorometer Controller
8816	NC	020	101-384175		BA	Power Monitor
8817	NC		9910466		CA	Master Warning System
8818	NC	026				Power Monitor Test Jig
8819	NC		5508002	NC	CA	Delay Timer
8910	NC	034				892 Test Jig
8911	NC	026				414/450 Funct Test Jig
8912	NC	034				8711 Test Jig
8913	A	014	9914026-2	B	CA	Windshield Temp Controller
8914	NC	042	806719-1	NC	HS	Voltage Suppressor
8915	NC	036		NC	MX	APT-25 Mother Board
8916	NC	036		NC	MX	Telco Interface Board
8917	NC	025				857 Test Jig
8918	NC	025				854 Lot Test Test Jig

Part Number Log
ICE to Customer Numbers

ICE PN	Rev	Disk	Customer P/N	Rev	Cust	Description
8919	A	009	8306031-80	NC	DL	Feed Sentry
8920	NC	034				8915 Programmer
8921	NC	034				8915 Test Jig
8922	NC	037	999734/5-80	1.2	DL	27C010 Chip-Set
8923	NC	010	8306003-80	G.1	DL	Multilanguage YMaster Card
8924	NC	034				311-1,-2 Test Jig
9010	NC	018	996430-84	5.1	DL	Communications Chip RMII
9011	NC	026				8919 Test Jig
9012	NC	014	9914287		CA	Trim Advisory Unit
9013	NC	014	9914378	B	CA	Master Command Module
9014	NC	041			HS	Analog Valve Indicator
9015	NC	041			HS	End Limit Valve Indicator
9016	NC				MX	DM-Voice Board
9017	NC	043	98748-001-5		VM	Economy Baler Monitor
9018	NC	044				908 Test Jig
9019	NC	045	93654-001-2		VM	Outrigger Monitor
9110	NC	041			VM	Baler Monitor
9111	NC	026				Curing Box
9112	NC	026				8614 Calibrater
9113	NC	044			US	Infrared Video Simulator
9114	NC	020				2-Way Chime
9115	NC	025			TC	New Spore Sampler
9116	NC				TI	Optical Hand Scanner
9117	NC	018			DL	Four Feed Station Cont
9118	NC	019	F7-51-1			319 Test Jig
9119	NC	026				9019 Test Jig
9120	NC	018			CA	DC Flap Controller
9121	NC	052			PT	DC Motor Controller
9122	NC	050			DB	Electro-Ejaculator
9123	NC	010			DL	+5 to -12 Volt Supply
9124	NC	050			DB	Electro-Imobilizer
9125	NC	050			DB	Obsolete see 9314
9210	NC				DB	Slide Warmer
9211	NC				AT	40 Pin SOT Substrate
9212	NC		120180-0104		PH	Inverter Box
9213	NC		8306903-80		DL	PM 5000 Computer
9214	NC		8306902-80		DL	PM 5000 Power Supply
9215	NC					Ceramic Heating Element
9216	NC		PC-13		DL	Stall Unit
9217	NC					9210 Alignment Jig
9218	NC				PT	Cart Control Box
9219	NC					PM5000 Test Jig
9220	NC		8306363-80		DL	PC Interface Board
9221	NC				DL	Backplane Wire Harness
9222	NC				DE	Mikrospectrometer
9223-1	NC		8306901-01		DL	Motherboard
9223-2	NC		8306901-02		DL	IDE Hardrive
9223-3	NC		8306901-03		DL	3.5" Floppy Drive
9223-4	NC		8306901-04		DL	Video Card

Part Number Log
ICE to Customer Numbers

ICE PN	Rev	Disk	Customer P/N	Rev	Cust	Description
9223-5	NC		8306901-06		DL	Power Plug
9223-6	NC		8306901-15		DL	Thumbscrew, Hardrive
9224-1	NC		8306902-01		DL	Modified Power Supply
9224-2	NC		8306902-04		DL	Power Supply Harness
9224-3	NC		8306902-05		DL	Strain Relief
9224-4	NC		8306902-06		DL	Power Switch
9224-5	NC		8306902-09		DL	Stand Off
9225	NC				PW	Brushless Motor Control
9226	NC				DL	PM5000 Power Test Jig
9227	NC				DL	PM5000 Line Power Bus
9228	NC				EN	PM Motor Controller
9310	NC				RS	Sprayer Controller
9311	NC				AC	Dream Steamer
9312	NC		114005	NC	VM	R-24 Command Control Box
9313	NC				FS	Battery Eliminator
9314	NC				DB	Ovulation Detector
9315	NC					9311 Test Jig
9316	NC				OT	Derailment Detection Syst
9317	NC		8306038-80	NC	DL	SST 2000

Part Number Log
Customer to ICE Number

Cust	Customer P/N	Rev	ICE PN	Rev	Description
AC			9311	NC	Dream Steamer
AP			898	NC	Fish Scale
AT			9211	NC	40 Pin SOT Substrate
BA			883		Stabilizer Deice Timer
BA	101-384138-1	A	8610-1	NC	New Chime w/o trigger
BA	101-384138-1	A	911C		(Obsolete)-see 8610-1
BA	101-384175-1	C	811	E	Inverter Monitor
BA	101-384175-1	NC	811A	NC	(Obsolete)-see-811
BA	101-384175-1	NC	8612	NC	(Not Approved)
BA	101-384175-1	NC	8818	NC	(Not Approved)
BM			894	NC	Infrared Video Sim.
BM			300030	NC	(Obsolete)-see 894
CA			878	NC	Boot Deice
CA	092275-01		76-1AA	NC	(Obsolete)-see 913-1
CA	76-1AA		761	NC	(Obsolete)-see 913-1
CA	76-1AA		913-1	NC	Surface Deice
CA	5508002	NC	711A	NC	(Obsolete)-see 8819
CA	5508002	NC	8819	NC	Time Delay
CA	881	NC	881	NC	(Obsolete)-see 8810
CA	8810	NC	8810	NC	Light Timer
CA	911E	NC	8610-2	NC	New Chime with trigger
CA	911E	NC	911E		(Obsolete)-see 8610-2
CA	9910285-1	A8	413-1	NC	(Obsolete)-see 913-2
CA	9910285-1	A8	413A	NC	(Obsolete)-see 913-2
CA	9910285-1	A8	913-2	NC	Surface Deicer
CA	9910380-1	NC	896	NC	Propeller Deice Timer
CA	9910412-1	B1	311-1	A	Temperature Control
CA	9910412-1	B1	311A	NC	(Obsolete)-see 311-1
CA	9910466	NC	8817	NC	Master Warning System
CA	9910466	NC	911A	NC	(Obsolete)-see 8817
CA	9910533	NC	611C	NC	(Obsolete) Light timer
CA	9914026-1	NC	313-1	NC	Windshield Temp. Cont.
CA	9914026-1	NC	313B	NC	(Obsolete)-see 313-1
CA	9914026-2	B	8913	A	Windshield Temp Controller
CA	9914287	NC	9012	NC	Trim Advisory Unit
CA	9914378	B	9013	NC	Master Command Module
CA	C165020-0101		11375-	NC	(Obsolete)-see 879
CA	C165020-0101		879	NC	2 Phase Prop Deice
CA	C165020-0201	B	514-3	NC	Prop Deicer
CA	C165020-0201	B	514E	NC	(Obsolete)-see 514-3
CA	C165022-0101	B	415	A	Surface Deicer
CA	C165022-0102		413-2		Surface Deice
CA	C165022-0102		413D		(Obsolete)-see 413-2
CA	C166065-0101	C	859	A	Windshield Deice
CA	C166065-0101	C	911D	NC	(Obsolete)-see 859
CA	C593005	NC	897	NC	Overvoltage Sensor
CA	PO72575-01		514-1	NC	Prop Deicer
CA	PO72575-01		514D	NC	(Obsolete)-see 514-1
CA	PO72575-02		514-2	NC	Prop Deicer

Part Number Log
Customer to ICE Numbers

Cust	Customer P/N	Rev	ICE PN	Rev	Description
CA	PO72575-02		514C	NC	(Obsolete)-see 514-2
CM			8811	NC	Controller
DB			922		Electro-Ejaculator Chord
DB			923		Electro-Ejaculator Probe
DB			926		Semen Collection Handle
DB			9122		Electro-Ejaculator
DB			9124		Electro-Imobilizer
DB			9125		Ovulation Detector
DB			9210		Slide Warmer
DB			933		922 & 923 Test Jig
DB			934		9122 Test Jig
DB			937		Ejaculator - Krusberg
DD			938		Profile O'Graph
DE			9222		Mikrospectrometer
DL			853		3-Minute Timer
DL			855		RTMS Feeder
DL			861	NC	Multitask 4 Timer
DL			8615	NC	854 Test Jig
DL			874	NC	856 & 864 Test Jig
DL			919	NC	SST II V6.0
DL			9117	NC	Four Feed Station Control
DL	8306363-80		9220	NC	PC Interface Board
DL			9221	NC	Backplane Wire Harness
DL		NC	9226	NC	PM5000 Power Test Jig
DL		NC	9227	NC	PM5000 Line Power Bus
DL			931	NC	9220 Test Jig
DL	8304463		869-1	NC	Stall Unit
DL	8304807-80		856	NC	Y Master Memory Mod
DL	8304900-81	G.9	857	C	Yieldmaster Board
DL	8305265-81	NC	887	NC	Stall take-off unit
DL	8305336-80	HF	854	B	IDU board
DL	8305426		869-2	NC	Antenna Interface Unit
DL	8305521-81	G.9	864	C	Portal IDU mem mod
DL	8305892-80		912-1	NC	Green Stall Unit
DL	8305892-83		912-2	NC	Red Stall Unit
DL	8306001-01		912-3	NC	Ant. Int. Unit Green
DL	8305898		912-4	NC	Ant. Int. Unit Green
DL	8306003-80	G.1	8923	NC	Multilanguage YMaster Card
DL	8306031-80	NC	8919	A	Feed Sentry
DL	8306380-80	NC	928	NC	PM5000 Plug-in Card
DL	8306901-01	NC	9223-1	NC	Motherboard
DL	8306901-02	NC	9223-2	NC	IDE Hardrive
DL	8306901-03	NC	9223-3	NC	3.5" Floppy Drive
DL	8306901-04	NC	9223-4	NC	Video Card
DL	8306901-06	NC	9223-5	NC	Power Plug
DL	8306901-15	NC	9223-6	NC	Thumbscrew, Hardrive
DL	8306902-01	NC	9224-1	NC	Modified Power Supply
DL	8306902-04	NC	9224-2	NC	Power Supply Harness
DL	8306902-05	NC	9224-3	NC	Strain Relief

Part Number Log
Customer to ICE Numbers

Cust	Customer P/N	Rev	ICE PN	Rev	Description
DL	8306038-80	NC	9317	NC	SST 2000
DL	8306902-06	NC	9224-4	NC	Power Switch
DL	8306902-09	NC	9224-5	NC	Stand Off
DL	8306902-80	NC	9214	NC	PM5000 Power Supply
DL	8306903-80	NC	9213	NC	PM5000 Computer
DL	985317-80		921		Milk Meter
DL	996430-84	5.1	9010	NC	Communications Chip RMII
DL	999734/5-80	1.2	8922	NC	Chip set
DL	PC-13		9216	NC	Stall Unit
DL	8306042-80		937	NC	SST 6.0
ED	800117	NC	904	NC	V4A Module Driver
EN		NC	9228	NC	PM Motor Controller
EV			925	NC	Meter
FS			9313	NC	Battery Eliminator
GT			8616-1	NC	863 Emulator
GT			8616-2	NC	863 Test jig
GT	DA25002	NC	871	B	Continuous Batch Dryer
GT	DA25020	NC	8711	NC	DC Motor Controller
GT	DA25010	NC	876	A	12 Volt DC Supply
GT			877-1	NC	871 Simulator
GT			877-2	NC	871 Test Jig
GT			884	NC	Igniter
GT	DA25003	NC	885	A	Continuous Flow Dryer
GT			889	NC	Temperature Probe
GT	77367	NC	892	A	Controller
GT	DA25001		863	E	Grain Dryer Control
HF	700709699		875	C	Baler Solenoid driver
HF	700707060	B	862	A	Speedometer
HS			8613	NC	414-450 Universal
HS	560655		8611	NC	8 Phase Timer
HS	774478-1	B	414-3	NC	Prop Deicer
HS	774478-1	B	414A	NC	(Obsolete)-see 414-3
HS	774934-1	D	414-1	F	Prop Deicer
HS	790112-4	E	851-2	NC	ATP Prop deicer
HS	790112-5	B	851-1	E	ATP Prop deicer
HS	774934-1	C	414B	E	(Obsolete)-see 414-1
HS	790219-1	B	414-2	C	Prop Deicer
HS	790219-1	A	414BC	B	(Obsolete)-see 414-2
HS	792113-1	NC	450-1	B	Prop Deicer
HS	792113-1	A	450-2	NC	Prop Deicer
HS	806719-1	NC	8914	NC	Voltage Suppressor
KP	ES62117-1	A	311-2	A	Cabin Temp Control
KP		NC	932	NC	Cabin Temperature Control
KP		NC	935	NC	932 Test Jig
KS			902	NC	KSU Grid Plane
MM		NC	939	NC	Quad I/O Board
MX		NC	8915	NC	APT-25 Mother Board
MX		NC	8916	NC	Telco Interface Board
MX	PM-200	NC	907	NC	HSC Programmer

Part Number Log
Customer to ICE Numbers

Cust	Customer P/N	Rev	ICE PN	Rev	Description
MX		NC	9016	NC	DM-Voice Board
OT			9316	NC	Derailment Detection System
PH	1E19-1	NC	511A	NC	(Obsolete)-see 895
PH	1E19-1	NC	895	NC	Deice Controller
PH	A27231272-10	D	852-1	NC	Temperature Controllers
PH	A27231272-11	D	852-2	NC	" "
PH	A27231272-12	D	852-3	NC	" "
PH	A27231272-13	D	852-4	NC	" "
PH	A27231272-14	C	852-5	NC	" "
PH	A27231272-20	A	852-7	NC	" "
PH	A27231272-20A	A	852-8	NC	" "
PH	A27231272-25	B	852-6	NC	" "
PH	F7-6-3	NC	909	NC	Recycle Control
PH	F7-51-1		9118	NC	319 Test Jig
PH	F7-51-3	C	319-1	NC	Cabin Heat Controller
PH	F7-51-3	C	319A	NC	(Obsolete)-see 319-1
PH	F7-51-5	C	319-2	NC	Cabin Heat Controller
PH	F7-51-5	C	319B	NC	(Obsolete)-see 319-2
PH	120180-0104		9212	NC	Inverter Box
PH	139-02E		899	NC	852 Test Jig
PL			917	NC	24 to 12 Volt Convertor
PT			9121	NC	DC Motor Controller
PT			9218	NC	Cart Control Box
PW			9225	NC	Brushless Motor Controller
RS			9310	NC	RHS Sprayer Controller
RW			416A	NC	(Obsolete)-see 893
RW			893	NC	Surface Deice Controller
TC			868	NC	Spore sampler timer
TC			9115	NC	New Spore Sampler
TI			9116	NC	Optical Hand Scanner
US			8714	NC	Power Switch
US			905	NC	Hybrid Power Switch
VM			918	NC	Bale Wrap Counter
VM			908	NC	Corn Picker Control
VM			927	NC	9017 Enclosure w/out holes
VM	93654-001-2		9019	NC	Outrigger Monitoritor
VM			9017	NC	Economy Baler Monitor
VM			9110	NC	Baler Monitor
VM	114005		9312	NC	R-24 Command Control Box
WR		4	8815	NC	Fluorometer Controller

AC A/C Enterprises	*HS Hamilton Standard
AP Action Products	*KP Keith Products
AT AT&T	KS Kansas State University
*BA Beech Aircraft	MM McPherson Manufacturing
BM Boeing Military Aircraft	MX Maxon
*CA Cessna Aircraft	OT On-Track Corporation
CM Clinton Moore	*PH Parker Hannifin/Airborne
DB Dr. Beeman	PL Plainsmen Manufacturing
DD Dr. Devore	PT Pillar Tech
DE D.O.M. Electronics	PW Peerless Winsmith
DL De Laval	RS RHS
ED Electr Display Systems	*RW Rockwell International
EN Envirosystems	TC Tennyson Collins
EV EHV Corporation	TI Texas Instruments
FS Free Spirit	US US Government
GT Gilmore Tatge	VM Vermeer Manufacturing
HF Hay & Forage	WR WRK

* Denotes those companies for which ICE manufactures and repairs aircraft parts.

KANSAS
TECHNOLOGY
ENTERPRISE
CORPORATION

KTEC's mission is to create and maintain employment by fostering innovation, stimulating commercialization, and promoting the growth and expansion of Kansas businesses.

Presentation to the
Kansas House Committee on Economic Development

September 27, 1993

By: Bill Brundage, President

KTEC RECOMMENDATIONS

The following are recommendations the outgoing president of KTEC presented before the committee:

I. The Legislature and Governor, as well as the private sector, need to support the Innovation/Commercialization Corporations. This will allow the private sector to make major investments in KTEC's efforts and will result in realizing a return on investment in the infrastructure KTEC has developed;

II. Support the seed capital investment fund up to $5 million. KTEC has been appropriated $1.5 million for Fiscal Year 1994. An additional $3.5 million will be required within two years. This will result in major private sector seed capital investment in the state;

III. The Legislature should consider funding, through KTEC, three business faculty positions--one each at the University of Kansas, Kansas State University and Wichita State University. The Legislature would fund one-half of the positions and KTEC could raise the balance of the funds from the private sector. These "new" faculty would champion entrepreneurial programs within their business schools;

IV. The state's universities should examine their curricula in the science and engineering disciplines and modify them in a way that the graduates would better quality for positions other than teaching and research at other universities. Ph.D.'s in the science disciplines can make excellent corporate heads if they are appropriately prepared while in school;

112 W. 6th, Suite 400 ■ Topeka, KS 66603-3869
913 /296-5272 EOE

House Economic Development
September 27, 1993
Attachment 7

V. The state's new contingency fund is very important. KTEC's programs are going to allow Kansas to recruit companies that require incentives other than tax abatements. This fund could allow the state to take advantage of a number of opportunities;

VI. KTEC is now ready to involve the Kansas Department of Commerce. Plans are being made to introduce KDOCH to KTEC's capabilities and enable them to recruit technology-based companies and entrepreneurs;

VII. The state should seriously consider the K-12 Entrepreneur Curriculum being developed by the Kauffman Foundation. This program could better educate and prepare our children for the economic future the state is creating;

VIII. Budget--continue funding KTEC at least at its current level ($11 million) and slightly more if possible.

If you continue your support, KTEC should be "almost" self supporting by the end of this decade.

Wouldn't this be unique!! The possibilities are unlimited if you continue on the course you have set; and

IX. Continue being involved. One of the reasons KTEC has been so successful is the involvement on the part of the legislators. You serve on our boards and committees. You know what is going on and you are a driving force. And, I suspect, some of you have even enjoyed it.

If you continue the course we have set, I predict that within three years, KTEC will represent the best investment that any state has ever made in economic development.

We have truly been the architect of our future not a descendent of the past.

I have learned to love Kansas and its people and my decision to leave was not an easy one. Kansas will always have a special place in my heart.

INFORMATION.....

I. Introductions & Personnel

Greg Schell & Ann Harrison - KSBE

John Poggio, Doug Glasnapp, Mark Pomplun & Lori Nebelsick-Gullett:

Center for Educational Testing and Evaluation
School of Education
B101 Bailey Hall
The University of Kansas
Lawrence, Kansas 66045-2327
telephone: (913) 864-3537
FAX: (913) 864-3566

II. Item Development: First steps

Included is a copy of the letter of invitation/participation sent recently to all Kansas USDs. The correspondence solicits nomination of local personnel to serve as item writers for the science assessment. Beside the obvious need to construct the science assessment, our further goals are: (1) to extend to the field the very real opportunity to have direct input to the substance of the assessment, (2) to obtain diverse, concrete and functional ideas for the assessment, and, (3) from the outset, to devise an assessment system that reflects what state educators deem important.

Attached is a listing of persons nominated to date. Review this list and before today's session ends identify; (1) any individuals on the list about whom you have personal knowledge and believe would make an outstanding item writer, and (2) include the name of any individual not on the list whom you know and whom you believe would make an outstanding item writer. Leave your sheet with one of us so that your suggestions can be considered. Final selection will be made by CETE with an eye to establishing reasonable representation across the state while insuring item writers at all levels (grades 5, 8 and 11).

House Economic Development
September 28, 1993
Attachment 8

III. Steps to be followed in the development of the science assessment:

1. Item writers, working independently, draft questions (4 weeks - October 8).

2. CETE reads, reacts, revises, modifies....etc. (4 weeks - November 5).

3. Revised item pool is distributed to another group of Kansas teachers and higher education individuals who review and evaluate, analyze, modify, add to, and otherwise alter drafted items (4 weeks - December 3).

4. CETE assembles all reactions, and combines feedback received to modify and revise items (3 weeks - December 31).

5. Time permitting, the advisory group is convened to react and make evaluative decisions about the pool of items (1 week - January 7).

6. Preliminary test forms are prepared and a limited field test is conducted; CETE revises based on results (2 weeks - January 21).

7. Tests are reviewed by panel of impacted groups and others deemed useful and appropriate to contact (1 week - January 31).

Instruments are finalized and printed following step 7 (not later than late January, 1994).

IV. Discussion of the format for the Science Assessment

To assist in arriving at the key decisions regarding the structure and format of the science examinations, consider the following four (4) approaches to testing. We are treating these as exemplars to help guide discussion. More elaborate and specific descriptions are to be developed depending on the choices made.

Type of Items	Characteristics
I. Objective testing	to include both traditional (multiple-choice, etc.) and, as can be conceived and validly introduced, non-traditional (multiple-correct) formats.
II. Restricted Response (performance assessment)	restricted response items taken by students individually and open-ended completed in a specified class session (e.g., one hour).
III. Individual Extended Task (performance assessment)	single problem, extended task (days, weeks) monitored and only broadly guided by instructor with final product/report produced by student. Perhaps each student completes a "test" (could be formatted as 1 and 2 above) in response to established questions.
IV. Cooperative Group Task (performance assessment)	perhaps two or three problems with one chosen by the local teacher that is used to engage small groups (3 to 5 members) in a project. The project for each group is an extended task (days, weeks) monitored by instructor and broadly guided with a final product/report produced by the group. Each student completes a "test" (could be formatted as 1 and 2 above) in response to established questions. Behavioral ratings regarding students as observed by the instructor are completed for each student.

Now consider the following practical and relevant factors.

A. *Workability* - can the format be used at a grade level given the course sequence/organizational structure within a school

B. *Burden/Cost* - what else exists that could negate use of this format; time and involvement of local personnel to score performance items

C. *Message/Timeliness* - does the format help educate, leading toward desirable change; should skills be evaluated with this format this year

Our evaluation of the appropriateness and suitability of the four item formats against the practical criteria (using a five-point rating scale: 1=extremely low, 5=essential, high) for each grade resulted as follows.

Grade 5:	*Workability*	*Burden/Cost*	*Message/Timeliness*
Objective	4	2	2
Restricted Response*	4	3	4
Individual Extended Task	3	5	4
Cooperative Group Task	3	5	4

Grade 8:	*Workability*	*Burden/Cost*	*Message/Timeliness*
Objective	4	2	3
Restricted Response	4	3	3
Individual Extended Task	3	4	4
Cooperative Group Task*	3	5	5

Grade 11:	*Workability*	*Burden/Cost*	*Message/Timeliness*
Objective*	4	1	4
Restricted Response	4	3	3
Individual Extended Task	1	5	4
Cooperative Group Task	1	5	4

This framework is intended to assist decision making regarding the format of the examinations.

SCIENCE ITEM DEVELOPMENT

AGENDA

Saturday, September 11

9:00 - 9:15	Welcome and Introductions
9:15 - 10:00	The Kansas Science Standards: A Panel discussion of the development and intent of the Standards
10:00 - 10:30	Science Item Development - requirements, rules, methods and procedures
10:30 - 10:45	Break
10:45 - 11:30	Continuing discussion of item construction
11:30 - 12:00	Group (by grade level) consideration of item development
12:00 - 12:45	Lunch
12:45 - 1:30	Group discussion and review continued
1:30 - 4:00	New item development (objective) in paired assignment

Sunday, September 12

8:30 - 12:00	Group consideration and development of cooperative group (grade 5) and independent student (grade 8) projects. (From 8:30 to 9:30 grade 11 participants will join in their discussions. At 9:30, Grade 11 pairs return to item development for their level).
12:00 - 1:30	All pairs reconvene to continue objective item development
1:30	Session ends

Definitions, Characteristics and Types of Objective and Performance Test Items

1. *Traditional multiple choice (one correct, single mark)*

   A stem, preferably a direct question, followed by 3, 4, or 5 choices. Includes one correct answer. Put effort into constructing good, viable, attractive, reasonable distractors. Use 2, 3 or 4 distractors. Number of choices can vary from item to item. Mark/Identify what you key as the correct answer. Do not worry about placement of correct answer (we will randomize later). The directions will be for a student to "select best choice to answer the question." Do not use "all/none of the above" as a choice. Make all choices of approximate equal length and grammatically parallel. Do not use specific determiners (always, never, etc.).

2. *Multiple Choice format; more than one correct answer but student is directed to mark only one choice (multiple correct, single mark)*

   Like the traditional format, but allows for more than one correct, defensible answer included among the choices. Follow structural rules above. Use sparingly, with caution, and only when justifiable. Remember, correct choices need to be equally correct differing only in the process one uses to get to an answer. Students will be directed to make one best choice.

3. *Multiple Correct, Multiple Mark*

   Appearance like a multiple choice (traditional) but students are told to mark all choices they judge correct. In effort, each choice represents a true/false, yes/no decision for the stimulus condition specified in the stem. Follow construction rules given under 1 above.

4. *Interpretative Exercise or Context-Dependent Item*

   A lengthy situation or condition is detailed to set up questions. Graphs, charts, illustrations can be used to build the context. Many (3 or 4) objective items using the models above are then posed given the content presented. As a format, this is analogous to a reading comprehension test wherein many questions are asked about a single selection.

5. *Matching Column - to be used with homogeneous material only.*

This item type sets up 3 or 4 conditions, then provides 5 to 7 choices. The task for the student is to select one choice to match/associate with each condition.

Remember the focus and intent of the Kansas Science Standards is on PROCESS. Models 1 through 5 above represent Objective test item formats. The following is the one performance format to be used at Grade 11 (one hour of dedicated test time) and can be used in the grade 5 and 8 project (cooperative and independent) to evaluate student learnings/understandings.

6. *Restricted response, open-ended performance assessment*

A specific question is posed (can come from a context situation that is given). Students are to produce a written response often within a time specification ranging from 10 to 20 minutes. Items are intended to evaluate thinking, judgmental skills. A good, high quality process multiple choice item, without its choices, is a form of a restricted response item. Be careful in development not to make the question too broad. Restricted implies a specific focus for the question. When this format is used, be sure to indicate the time the student is expected to spend preparing a response. See Kansas Math Assessment for examples.

ELEMENTS FOR SCIENCE ASSESSMENT ITEMS

CRITERIA			CONSIDERATIONS
ESSENTIAL	VS.	TANGENTIAL	1. It fits into the core of curriculum 2. It represents a "big idea"
AUTHENTIC	VS.	CONTRIVED	1. It uses processes relevant to the discipline 2. Students are likely to value the outcome of the task
RICH	VS.	SUPERFICIAL	1. It leads to other problems 2. It raises other questions
ENGAGING	VS.	UNINTERESTING	1. It is thought provoking 2. It fosters persistence 3. It motivates
ACTIVE	VS.	PASSIVE	1. Student is worker 2. Students interact with other students 3. Students are constructing meaning and deepening understanding 4. Students remain engaged
FEASIBLE	VS.	INFEASIBLE	1. It can be done within school/homework time 2. It is safe 3. It supports instruction
FAIR	VS.	BIASED	1. Item should be unbiased in terms of culture, gender, etc.

Guidelines for Kansas Science Item Development, September 1993

SUGGESTIONS FOR GETTING AN IDEA TO BECOME A TEST ITEM...

1. *Start with an idea, preferably a "BIG" idea; that is, an idea/concept that helps you to organize and understand your discipline.....the source(s):*

   From a textbook or other book
   From a newspaper or magazine article
   From a life experience
   From conversation with colleagues or others
   Random thought
   ... Divine inspiration..that which you find intriguing

2. *Evaluate the relevance of the idea.....*

   Is it important? Does it clearly center on an important concept or issue in science?

   Does it place a premium on *process* understanding?

   Does it match important outcome goals?

   Is it contextualized? Does it link the concept or issue to real life? Does it lead students to deal with the concept or issue instead of just memorizing it...does it make students use it, understand it, explain it to others, or otherwise take some ownership of it?

3. *Begin converting the idea into a prompt/test item.....*

   Define the objectives of the task. What will this prompt/test item tell you about students? What knowledge/skills/abilities/attitudes/attributes will students have to display in order to successfully handle this task?

   Write a complete prompt/test item statement, including task statement, purpose, and suggestions to students on strategy and focus. Keep your original objectives in mind throughout! Try to focus the prompt/test item in the direction of these objectives.

4. *Consider embellishments.....*

   Can the problem be made "multi-media" (e.g., multiple performances or products around the same theme). Consider written exercises or reports, oral reports, group discussions or performances, student logs or portfolios, self-assessments, etc.

   Can the task be structured to elicit attitudes and attributes which can be measured (e.g., group cooperation, persistence, resourcefulness, etc.)?

   Can the task be structured to include a group activity?

5. *Consider what a teacher will need to know to administer the prompt...*

What materials and equipment are needed?

What problems or difficulties are likely to occur?

What kinds of assistance or intervention should the teacher be prepared to provide? What kinds of assistance should the teacher not provide? How should such interventions be treated in scoring?

Develop NOTES TO TEACHER to include all of the above.

6. *Design a scoring approach to the problem....*

Consider your original objectives -- how will they show themselves in student's responses?

Decide whether you are assessing processes or products.

Identify either dimensions of performance or aspects of the product which (a) reflect the objectives you had for the prompt; and (b) can be observed and rated with reasonable objectivity.

Weight the dimensions in proportion to their importance, using your own judgement and that of colleagues.

Develop levels of performance which you feel are likely to be present in student performance or products.

Build a section within the prompt to communicate to students how their performance will be evaluated.

SOME DIMENSIONS ALONG WHICH PROMPTS VARY

1. LENGTH

   a. Short -- One classroom period or less

   b. Long -- More than one classroom period -- might be done over a month or more (mostly outside of the classroom)

2. AMOUNT OF STRUCTURE PROVIDED

   a. High Structure

Problem definition --	problem to be solved is carefully defined for students
Scaffolding --	guidance/directions/suggestions provided on how to begin working toward a solution
Alternate strategies --	relatively few alternate pathways to a correct answer or solution exist;
Alternate solutions --	There is one correct answer to the problem.

   b. Low Structure

Problem definition --	student has wide latitude in selecting and/ or defining the problem
Scaffolding --	no guidance is provided on how to begin working toward a solution
Alternate strategies --	there are many ways to approach the problem
Alternate solutions --	There is no single correct answer to the problem.

3. TASK PARTICIPATION

a. Individual --	Student works alone throughout all phases of the task.
b. Group --	Students work as part of a group throughout all phases of the task.
c. Mixed --	Some aspects or stages of the task are done alone and some are done as part of a group.

4. EVALUATION FOCUS

a. Process --	Student's actions and behaviors, i.e., actual performance is observed and rated.
b. Product --	The concrete product of the performance is observed and rated (i.e., a paper or report, a model, apparatus, a proposed answer sheet, etc.)

5. PERFORMANCE MODE(S)

a. Single --	Only one performance mode or product to be evaluated
b. Multiple --	Student must perform in a variety of modes (e.g., written report, oral report, graph or chart, log, etc.)

Specifications and Parameters for the Grade 5 Cooperative Group Items

The Cooperative Group Test Question/Prompt will be administered following the conditions and expectations detailed below. The question itself should not be so specific that to do the project removes all choice and decision making from students, nor so broad that excessive time would be spend on simply trying to determine what to do. The question you create needs to be somewhere between these extremes, perhaps specifying certain absolute requirements (e.g. observe the solution for exactly 20 minutes, gather data from at least 10 observations but not more than 15, etc). Do not build an item that is constructed as a series of developing, task questions. We feel the item/prompt needs to stipulate a question and the students construct the entire stage/steps to the solution. They will be told the criteria that will be used to rate/evaluate their report. Finally the project needs to be such that each student in the group can and indeed should become involved in the project. The controlling conditions follow.

- Heterogenous/random groups of 3-4 students per group will be formed by local instructors.
- In class time on a project is not to exceed 4 class periods to be started and completed within 2.5 weeks (13 class days).
- All writing and planning is to occur in class.
- Information/data gathering outside of class/school (home work) is permissible, but only information and data collection may occur.
- Teachers become involved only to provide directions and little else.
- Teachers are expected to monitor all in class activities of each group. Each teacher will report and evaluate the behavior (e.g. participation, cooperation, effort) of the class as a unit (i.e., rate the extent of class....).
- Each student will be asked to provide a self-evaluation of their experience and to offer general appraisal of their own and their group's performance.
- One log/journal is to be maintained by each group to record and document decisions, hypothesis, methods, procedures, analyses, findings, etc. This task is to be shared among all group members (i.e. record keeping for each day rotates across members). This is a minimum, individual logs could be required if appropriate to the task.
- A report of project findings is prepared by the group.
- A test is to be available to evaluate student learning from the project. The test is to be taken by each student.
- The test (built by you as part of the project) may be objective and/or open-ended and is to be graded by the local teacher.

Specifications and Parameters for the Grade 8 Independent Student Project

The Independent Student Test Question/Prompt will be administered following the conditions and expectations detailed below. The question itself should not be so specific that to do the project removes all choice and decision making from students, nor so broad that excessive time would be spent on simply trying to determine what to do. The question you create needs to be somewhere between these extremes, perhaps specifying certain absolute requirements (e.g. observe the solution for exactly 20 minutes, gather data from at least 10 observations but not more than 15, etc). Do not build an item that is constructed as a series of developing, task questions. We feel the item/prompt needs to stipulate a question and the student constructs the entire stage/steps to the solution. Finally, students will be given choice, that is a number of project prompts and they choose the one they wish to work on. the controlling conditions follow.

- In class time on a project is not to exceed 4 class periods to be started and completed within 2.5 weeks (13 class days).
- All writing and planning is to occur in class.
- Information/data gathering outside of class/school (home work) is permissible, but only information and data collection may occur.
- Teachers become involved only to provide directions and little else.
- Teachers are expected to monitor all in class activities of each student. Each teacher will report and evaluate the behavior (e.g. participation, effort) of the class as a unit (i.e., rate the extent of class....)
- Each student will be asked to provide a self-evaluation of their experience.
- Students are to prepare a report of their project findings. It is to be evaluated by the instructor (see goal for Grade 8 student independent project, page 8 in Science Standards for details and guidance regarding projects.)
- A test is to be available to evaluate student learning from the project.
- Taken by each student, the test (built by you as part of the project) may be objective and/or open-ended (and is graded by the local teacher).

General Information, Due Dates and Payment

- Each grade 5 and 8 participant is to construct one (1) cooperative/ independent project. Do not invest time constructing more than two (2) such prompts.

- Each grade 11 participant is expected to produce 3 or 4 restricted response items.

- Each grade 5 and 8 participant is expected to produce between 30 to 50 objective type items. Grade 11 participants from 40 to 60 items.

- Specify the themes, processes and content focus of each item you produce.

- Remember, quality over quantity is always preferred (but great quality with tremendous quantity gets a prize!)

- Work alone; confidentiality and security of materials is essential!

- Getting a reaction is okay, but do not share specific items with colleagues.

- Do not copy items from other sources (okay to use a model but be certain to alter substantially).

- Call if you have any questions: John Poggio (913) 864-4510; Lori Nebelsick-Gullett, Mark Pomplun or Doug Glasnapp (864-3537).

- Material need not be typed, but please write legibly. Be sure illustrations are accurate and clear. If pictures are used, you must supply originals in black and white with source information.

- **Return to us by first class mail your first week's production (approximately half) on September 21.**

- **Return your final (second half) production material via first class mail on September 29.** Include all receipts and itemized expenses in this shipment. Payment, including your stipend, will be processed upon receipt. Expect reimbursement 3 weeks later.

KinderEconomy+ Introduction

Of all the disciplines in the educational arena, economics can be one of the most intimidating to teachers. As a result, many teachers may be reluctant to implement economics and students lose an integral part of a well-rounded education, a part that enhances their roles as students, as well their roles as productive members of society. *KinderEconomy+* is an easy-to-use, proven method to close the gap between economic illiteracy and the capacity to make well-informed economic decisions. The program accomplishes this through a series of experiences in which students face economic issues commonly encountered in the real world.

After mastering basic economic concepts, students are further empowered with a framework for making sound decisions in all aspects of their lives through careful examination of their options and the benefits each option offers. The advantages of improved student decision making become evident as students use critical thinking in problem solving. Further benefits surface as students become active leaders and reflective participants in society. Ultimately, the quality of democracy within our nation improves as a result of the awareness of its citizens and their involvement in society.

KinderEconomy+ is designed for kindergarten, first, second, and third grade students. The curriculum spans the course of one semester and provides a comprehensive instructional sequence. The activities motivate students by presenting concepts in a meaningful way, one that is applicable to their own lives and experiences. *KinderEconomy+* integrates social studies, mathematics, language arts, and the visual and performing arts providing an interdisciplinary approach to teaching economics. Simulation, role playing, and experience-based learning prepare students to become effective "*KinderEconomists.*"

The *KinderEconomy+* program is in two parts:

1. **Teacher Resource Manual**—unit outlines, step-by-step lesson plans, plays, choral readings, learning centers, a glossary of economic terms, and other supplementary materials.
2. **Student Activities**—worksheets, tests, family letters, transparencies, market surveys, and a poster.

KinderEconomy+ consists of ten chapters, nine of which follow a three-step process: experience, debriefing, and reinforcement. First, the students experience economic situations in which their reactions determine the outcome of the situation. Then, the teacher debriefs the students about the situation and distills the concepts they have experienced. Finally, the teacher reinforces the experience by providing supplementary activities to extend their knowledge. The final chapter helps the teacher integrate *KinderEconomy+* across disciplines.

The curriculum opens with the introduction of scarcity, in which students must allocate a limited resource, such as an orange or a limited number of scissors, among the entire class. This prepares the students for thorough examination of the methods of distribution. Next, students explore the concepts of opportunity cost and cost-benefit analysis by choosing among alternatives, identifying what they gave up, and deciding whether or not it was a wise decision. They then learn to combine and organize resources to produce goods or services efficiently for the classroom society. Students eventually implement a banking system, including a money supply, in order to handle the money earned through production and spent through consumption, thus discovering the strengths of the money system in comparison to the barter system. In analyzing the market within their classroom society, the concepts of supply and demand and the relationship between them, become evident to the students. The program culminates with the establishment of a business venture, integrating all concepts learned throughout *KinderEconomy+*.

The *KinderEconomy+* curriculum encourages family support and participation. Families assist students in applying what they have learned in the classroom to decisions made at home and in other situations. *KinderEconomy+* also reinforces economics for teachers, as well as families. Because of the simplicity of the economic concepts, students not only are able to master them, but are able to assist others in their understanding and application of economics.

KinderEconomy+ gives students the opportunity to make decisions and bear the consequences of their actions through exposure to basic economic concepts and practices. With this process, skills such as problem solving, critical thinking, and decision making are enhanced. The program lets students transfer the skills they learn out of the economic domain and into the scope of everyday life.

The *KinderEconomy+* **Teacher Resource Manual** includes reduced **Student Activity** pages for easy reference.

House Economic Development
September 28, 1993
Attachment 9

Activities

The *KinderEconomy+* Student Activities are one part of a two-part package. The first part, the Teacher Resource Manual, contains lesson plans for teachers.

ISBN 1-56183-475-0

CONTENTS
KinderEconomy+

THE WALL STREET JOURNAL

★★★ WESTERN EDITION | FRIDAY, JANUARY 4, 1985 | RIVERSIDE, CALIFORNIA

Economics 101 Goes To the First Grade, And Kids Eat It Up

* * *

They Establish Own Societies And Soon Absorb Basics; Jared Hopes for a Ferrari

By ANNE MACKAY-SMITH
Staff Reporter of THE WALL STREET JOURNAL

Roy Eyal, while holding a job as town treasurer, has launched a lucrative waste-disposal operation and an entertainment business and is about to move into banking. That isn't bad for someone who just turned eight years old.

Welcome to Kinder-Economy, a program that teaches economics to children as young as five years old by setting up a tiny society that mimics the real world. Thanks to their business and government roles in the classroom, Roy and his classmates now can chat about scarcity, opportunity costs, and supply and demand. And like their elders, they routinely overspend their government revenues, inflate their economy and take a remarkable number of companies into bankruptcy proceedings.

These youngsters are first- and second-graders at Welby Way Magnet School in Canoga Park, Calif. But Kinder-Economy, along with a version called Mini-Society that is aimed at older children, has caught on in cities all around the country. There are other such programs, but these are among the biggest and most successful.

Candy and Wrestling

Kinder-Economy begins with the concept of scarcity. A teacher brings in one or two candy bars, say, or ice-cream certificates and says the pupils must decide how these resources will be allocated. The class usually tries a variety of solutions, such as sharing (impractical with just one Hershey bar), first-come first-served (determined by a foot race), force (an arm-wrestling match) or a lottery.

Some children may enjoy one or more of these solutions. "Berek told me his favorite means of allocating resources was force," says Sophie Rosenberg of her burly seven-year-old son at the Welby Way school. "I explained that he may be the biggest in this class but sooner or later he won't be."

Most children decide that the best way to allocate resources is to earn them. That's when they establish their society.

The creator of both Kinder-Economy and Mini-Society is Marlyn Kourilsky, the director of teacher education at the UCLA graduate school of education. Mrs. Kourilsky estimates that her system is being taught in 40 states. She not only believes that young children can learn sophisticated economic concepts; she also believes that they should. "I've taught economics at the secondary level," she says, "and found that that's already too late to teach certain economic principles."

Samuelson's View

Paul Samuelson, the Nobel economist who wrote one of the nation's most popular college economics texts, agrees that "young children—and I speak as a father of six—pick up basic notions of economics very quickly." And economics educators generally applaud Mrs. Kourilsky's approach. "It's a very powerful teaching tool," says James B. O'Neill, economist and director of the Center for Economic Education at the University of Delaware.

Educators also say, however, that Kinder-Economy and Mini-Society are hard to teach, demanding an unusual amount of teacher talent, preparation and energy. Some teachers "burn out" after a couple of years, says Robert Reinke, the president of the National Center of Economic Education for Children, in Boston. He gives Mrs. Kourilsky's system generally high marks. Still, he says, "there's a problem with how useful it is if you can't get teachers to teach it." According to Mrs. Kourilsky, tens of thousands of teachers have been trained in the system.

At the Welby Way school the teacher is Valerie Plaisance and the society is called Karate Kid Land. Roy and Berek and the other children run the treasury and hire classmates for jobs ranging from paymaster to "crumb-buster" (sweeping). Businesses include food stores, a jewelry shop and a casino. The children have named their currency units Kids Inc's after a popular television show and call them KIs for short.

"Land," otherwise known as desks, the piano, blackboards and the like, was sold for the benefit of the city treasury. Roy bought the piano for 120 KIs and charges other pupils 15 KIs apiece to play. He also bought the trash can and charges one KI for each item deposited. Lately he has begun selling traveler's checks and is thinking of starting a bank.

The kids learn fast. Mrs. Plaisance, who earns a healthy KI income consulting, stops to talk with the disconsolate owner of the shaky casino. "Didn't you do a market survey to find out if anybody wanted to play?" she asks. She advises him to advertise or lower the prices he is charging. He does both, and the next day the casino experiences a boom as six people play.

Enthusiasm abounds even when affluence doesn't. "I have a goal to earn 1,000 KIs before the year is over," Berek Marcus, Ms. Rosenberg's son, tells a class visitor. How many does he have now? "Eighteen," he says. Roy already has about 700.

At "town meetings," problems are thrashed out and the children learn the proper terms for the economic principles they have encountered. The word "deficit" crops up when the city treasury runs low because of a long roll of city employees. The citizens briefly solve the problem by instituting property taxes, but, like other Californians, they become disenchanted with the high rates (a sudden rash of land sales is the immediate result). Now the children have decided to do away with taxes; they will simply print more money when they need it. Learning the word "inflation" now is in order.

Lately, Mrs. Kourilsky says, her programs have boomed. "There's just a big interest in the whole population to become more economically literate" because of deficit worries and past economic jolts, she says.

The Governor's Visit

In Delaware, some 300 teachers have been trained to teach the program, and one class was visited by Gov. Pierre S. du Pont IV. Warned that he would have to earn any classroom currency he spent in Rose Marie Wright's second-grade class, the governor brought along five autographed photographs of himself and auctioned them off.

The bidding was high, and the class reaped a whirlwind. The governor left with about a third of the economy's money supply in his pockets, plunging the society into a deep recession. "They never asked me back," Mr. du Pont comments. "Didn't want to disrupt their economy, I guess."

Such difficult lessons are what makes the program so successful, educators say. "How is it that people learn their jobs or anything else?" asks Douglas Miller, the director of the Long Beach (Calif.) Economic Literacy Council. "It's from experience."

House Economic Development
September 28, 1993
Attachment 10

MINI-SOCIETY: AN OVERVIEW

What is Mini-Society?

Mini-Society is a "self-organizing, experience-based approach to teaching youngsters about entrepreneurship as well as about economics, government, career options, consumer issues, and values clarification."

--Marilyn Kourilsky, PhD
Vice-President,
Center for Entrepreneurial Leadership
Ewing Marion Kauffman Foundation and
Creator of Mini-Society

It is suitable for children in all elementary grades, although research indicates best results in grades three through six.

In the Mini-Society instructional system, students experience developing and living in their own society in their classroom. Concepts are learned through these experiences and through the debriefing sessions in which concepts, problems, decision-making, etc. are discussed and analyzed, e.g. "How Do I Know Anybody Will Buy My Product? (Market Survey, Demand, Risk Taking, and Entrepreneurship)"

How much time does Mini-Society require?

It is suggested that sessions of 35 to 60 minutes, three times a week for ten weeks, be devoted to Mini-Society. Most often teachers incorporate Mini-Society into their social studies time, but it has been included successfully in math or language arts time periods as well.

How does Mini-Society work in the classroom?

The teacher initiates the Mini-Society in the classroom by focusing on the basic economic problem of scarcity, and suggesting the students form their own society within the classroom.

Students identify activities for which they will be paid, name their Mini-Society country and currency, decide on job criteria for civil servants, interview and hire civil servants, design their Mini-Society currency and flag, and select a treasurer.

Gradually the Mini-Society evolves, with students receiving payment in their country's currency, and beginning to trade or establish businesses in which to use their currency.

House Economic Development
September 28, 1993
Attachment 11

As situations occur in the classroom Mini-Society, debriefings are held to analyze and learn from the situations. Generally, lessons are taught in response to happenings in the Mini-Society or are generated from a "need-to-know" situation.

Business sessions can be held at the teacher's discretion. Some Mini-Societies hold business sessions weekly, while others have business sessions only three or four times during the ten-week Mini-Society period.

What response does Mini-Society generate from others in the school and community?

Generally, Mini-Societies are received positively by other teachers, principals, school staff, and parents. Mini-Society provides opportunities for school staff, parents, administrators, and others in the community to become involved in the classroom.

How do teachers feel about implementing Mini-Society in their classrooms?

The following comments by Mini-Society teachers are typical ones:

"I was amazed how well third graders picked up on these concepts. One little boy even shouted, 'Opportunity cost! Opportunity cost! I have to make a choice here in the lunch line. We have two kinds of cookies.'"

"I have several 'problem' students who usually have trouble concentrating on school work. They are the ones who have 'taken off' in their businesses! Fantastic!"

"The parents were very involved. It was the first time I had met several of the parents!"

"Plusses: Parents love it! Kids love it! I love it!"

CONTENTS

KSU
KANSAS STATE UNIVERSITY

Center for Economic Education

229 KSU Foundation Center
2323 Anderson Avenue
Manhattan, Kansas 66502-2912
913-532-5597
FAX: 913-532-7732

ECONOMIC LITERACY AND THE NATIONAL GOALS

An understanding of the basics of how our economy works is essential if our citizens are to understand and support rational economic policy and if our high school students are to graduate ready to be productive in our workforce.

A basic understanding of how the U.S. economy works and an ability to use fundamental economic analysis should be among the outcomes of American education.

Much is currently being done to enhance economic literacy among American school students. Those efforts are supported by educators, business, and labor.

Setting national goals and standards which include economics in a proper context will enhance the progress being made at the state and local levels.

If national goals and standards do not include economics, the local and state efforts and successes are very difficult to maintain.

Given the current emphasis on economic issues, attention to the economic literacy of future generations of students is a logical step.

The study of economics should be included:

* in the explicit definitions of our national education goals;
* in national standards and assessment; and
* in federal, state, and local teacher training and curriculum development programs.

The interest in the National Education Goals and the efforts to identify the best in school reform are all based on a concern with our economic ability as a nation to enhance living standards, to provide employment opportunities for all, and to generate enough resources to address our major economic problems. **Economics is the primary cause; economic understanding is an important part of the solution.**

An understanding of how our economic system functions and an ability to use basic economic reasoning and analysis are absolutely necessary if our students are to be prepared for responsible citizenship--Goal Three of the National Education Goals--and if every

House Economic Development
September 28, 1993
Attachment 12

adult American is to exercise the rights and responsibilities of citizenship--Goal Five.

An understanding of why education is so important to increased productivity and ultimately to income is an essential part of preparing our students for productive employment in our modern economy and our adults to compete in a global economy--Goals Three and Five.

States have recognized the importance of basic economic understanding, and thus economics has been an increasingly important part of the elementary and secondary curriculum. Twenty-eight states, representing two-thirds of the nation's students, require infusion of economics throughout the kindergarten through twelfth grade curriculum. Sixteen states, representing 50 percent of the nation's students, require a semester-long separate course. Many more students attend schools and study in districts where economics is infused throughout the curriculum and where separate courses at the senior high, and in some cases the junior high level, are offered and required.

The National Council for the Social Studies recognized the importance of economics in its most recent set of recommendations by proposing infusion and a one-year-long course of government and economics.

The College Board has recognized its importance by establishing two Advanced Placement examinations in economics.

The National Federation of Independent Business has stated that the basic core curriculum should include economics along with reading, writing, math, science, and history.

Last year's higher education bill specified economics as a key academic subject for the purposes of teacher training.

The National Assessment Governing Board has recently decided that economics will be included in the national assessment prior to the year 2000.

A recent Gallup survey showed that 96 percent of the American public believe we should do more in our schools to teach our youth about our economic system.

ALL SIN IS A RESULT OF A COLLABORATION

STEPHEN CRANE

House Economic Development
September 28, 1993
Attachment 13

THE UNIVERSITY AND TECHNOLOGY TRANSFER

University of Kansas Policy on Intellectual Property:

* encourages its faculty, staff and students to engage in professional activities which are consonant with the University's objectives

* supports such professional activities and recognizes that they may lead to the creation of new knowledge which will benefit society. Such knowledge may be best disseminated through commercial channels.

* insures that the dissemination of the results of professional activities will be directed toward the greatest public benefit consistent with the rights of the originator(s), the University, and outside agencies which may have supported those activities.

Public Law 96-517, the Bayh-Dole Act: 1980

* For inventions deriving from Federal funding, title to inventions given to the University

* Government retains a royalty-free right to practice invention

* Government support viewed as leveraged funding. The public interest and return to government on its investment is realized through downstream effect of placing products into commerce.

* No significant government intervention in the process of transferring university-based inventions into the hands of industry

Effect of law

* 1980- 390 patents issued to U.S. University's
* 1990- 1115 patents issued

THE GAP (S)

I

UNIVERSITY CULTURE — BUSINESS CULTURE

Publication needs — Proprietary needs

II

THE 100 MILLION DOLLAR EXTRAMURAL FUNDING BASE

III

FUNDING STEAM FOR TECHNOLOGY TRANSFER OFFICES

Patents------License-------Royalty

Knowhow-----equity--------revenue sharing

IV

CENTERS OF EXCELLENCE
Economic development-Startup companies
HIGUCHI BIOSCIENCE CENTERS
Interx Merck-Oread Labs-Cydex-
CECASE-CENTER FOR EXCELLENCE IN COMPUTER AIDED SYSTEMS ENGINEERING
DDI-

V

SMALL BUSINESS INNOVATION CENTERS

PURPOSE OF THE KANSAS INNOVATION CENTER

The Kansas Innovation Center (KIC) was formed for the purpose of enhancing technology transfer activities, business incubation, and business development in Northeast Kansas and the Kansas City metropolitan area. It is a public sector/private sector partnership involving the Small Business Administration; the University of Kansas; the business community. The primary goal of this partnership is to facilitate economic development in the region.

KANSAS INNOVATION CENTER ADVISORY BOARD

Dr. Howard E. Mossberg, Vice Chancellor RGSPS and Chair

Dean Joseph Bauman, KU School of Business

Mr. Sam Campbell, President, Campbell-Becker, Inc.

Dean Al Chapman, KU Medical Center

Mr. Ben Craig, President Metcalf State Bank

Dr. Charles Decedue, Exec. Director, Higuchi Biosciences Center

Dean Carl Locke, KU School of Engineering

Dr. Tony Redwood, Professor KU School of Business

Mr. Michie Slaughter, Chairman, Center for Entrepreneurial Leadership, Kauffman Foundation

Mr. Gary Toebben, President, Lawrence Chamber of Commerce

Dr. Robert P. Zerwekh, Associate Vice Chancellor, RGSPS, KU