

A Working Definition of Science and Technology- or Technology-intensive Business or Industry

A project prepared by the class of

PPM 653 - State and Regional Economic Development

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Edmund S. Muskie School of Public Service
University of Southern Maine

for

The Maine Science and Technology Foundation

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Description of the Project

PPM 653, State and Regional Economic Development is a graduate level course within the Muskie School of Public Service at the University of Southern Maine. In the fall of 2001 Professor Mark Lapping taught the course. Among the various tasks Dr. Lapping assigned to the class was a project to assist the Maine Science and Technology Foundation in developing a definition of a "Science and Technology Firm".

Mr. James Damicis, Director of Research for the Maine Science and Technology Foundation (MSTF) met with the class early in the semester. At this meeting Mr. Damicis explained the difficulty that MSTF was having in defining a science and technology firm. He believed that a better definition would help MSTF to focus its limited resources. He stressed that the definition should be measurable and replicable. At this first class Mr. Damicis provided us with a variety of information sources that we could use to learn more about science and technology firms.

Much of our time was subsequently spent gathering as much information as possible on science and technology firms and on efforts to define them. A variety of sources were scoured for information including: thirty-nine State economic development and science and technology web sites; Federal Government web sites, such as those of the Department of Commerce, Department of Labor, Internal Revenue Service, and the Federal Patent Office; professionals in the Science and Technology field, and journals, such as the Economic Development Quarterly, Regional Science, and the Journal of the American Planning Association.

While compiling this information we came to realize that although there was abundant information on science and technology firms, and even a few definitions, there was no standard definition which was widely accepted. Based on our research, we developed the following definition:

To be classified as an S&T firm, organizations must establish a business model that exploits sophisticated technologies and processes by creating proprietary or patented business and/or research functions that encourage strategic advantages in the marketplace.

We realized, however, that this definition required some means of evaluation in order to make it practicable and replicable. This was the point at which we developed what was to become the “33 Point Scoring System” to support and operationalize our definition.

The 33 Point Plan – Scoring System

The 33 Point Plan is a “tool” to ascertain the degree to which a firm can be deemed “a high technology business.” Many of the indicators used in the 33 Point Plan are considered in other national evaluations and reports; others have only been referenced or mentioned. The indicators deemed most germane for this analysis are: (1) Salaries & Wages; (2) Percentage Share of S&T Occupations; (3) Percentage Share With Advanced Degrees; (4) Dollars Spent on R&D per Employee Annually; (5) Continued Training Hours per Employee Annually; (6) NAICS & Residency Benchmarks; and (7) Patents.

What follows is a description of each indicator for the “33 Point Plan” along with the appropriate citations, which support the inclusion of each one..

Factor 1

Salaries and Wages

According to the Corporation for Enterprise Development's *Development Report Card for the States 2001*, "States with companies that are taking the high road to development and investing in human resources – high salaries, wage increases, and health benefits – are among the highest performing states overall. Investments in people positively influence other measures of economic, social and environmental well-being."

The results of this study rank Maine 39th in average annual pay and 24th in the number of working poor. The Maine Department of Labor reports that the percentage change of the Maine average annual wage between 1999 and 2000 ranked forty-eighth among the fifty states. Maine's average annual income in 2000 was \$27,664.00, the lowest of the six New England states.

In sectors believed to be 'high-tech,' wages show a bit of a different story. According to information provided to us from the Maine Science and Technology Foundation and Maine Department of Labor reports for 1999, Maine's technology intensive industries pay an average annual salary of \$40,500.00. In examining the Bureau of Labor Standards *State Occupational Employment Wages Report For 2000*, we find that occupations in the "Life, Physical, and Social Sciences" category have a mean annual salary of \$42,470.00; "Architecture and Engineering" occupations have a mean annual salary of \$49,860.00, and occupations categorized in the "Computer and Mathematical" fields have a mean annual salary of \$46,260. Each of these broad categories is broken down into specific occupations with mean annual salaries listed for each occupation.

Taking these reports and statistics into account, we recommend the following as one aspect in criteria to determine if an industry, sector, or business has the potential for being 'high tech.'

Points	Criterion
1	Meeting or exceeding Maine average annual wage
2	Meeting or exceeding 1.5 times the Maine average annual wage
3	Meeting or exceeding 2 times the Maine average annual wage

We believe this model accurately reflects the wages a high technology business, industry or sector will pay highly skilled workers. It is relatively easy to update, using Maine Department of Labor statistics, and should be updated annually to reflect changes in average annual wage and wages earned in the 'high tech' sector.

The Maine Department of Economic and Community Development in its "2001 Economic Development Strategy" asserts, "Our vision is a high quality of life for Maine citizens. Central to that vision is a sustainable economy that offers the opportunity for everyone to have rewarding employment and for business to prosper, now and in the future." The Maine Science and Technology Foundation states in its "2001 Science and Technology Action Plan" that "successful economies do not result from any quick fix, but from long-term investments in human and physical infrastructure." To reiterate the findings of the Corporation for Enterprise Development, "Investments in people positively influence other measures of economic, social and environmental well-being." By encouraging high technology companies to adequately compensate their employees for their skills and knowledge, we will be taking a step toward strengthening Maine's economy.

Sources of information:

1. State of Maine Economic Development Strategy,
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Maine Department of Labor, Labor Market Information, November 2001
3. Maine's Science & Technology Action Plan 2001: Positioning Maine For The New Economy,
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4. 2001 Report Card Data, Trends in Employment & Wages 1998,1999
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5. 2000 State Occupational Employment and Wage Estimates, Maine, New England
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6. Comprehensive Measure Ranking and Five-Year Trends: Maine,
Corporation For Enterprise Development
<http://drc.cfed.org/grades/pages/maine.pdf>
7. Key Findings for 2001: Employee Investment and Performance,
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