

Academic - Industry R&D Collaborations

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Workshop on Industry – University Collaborations
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Why Collaborate?

Industry

- Increased exposure to new technologies;
- Enhance the knowledge base of employees;
- Conception of new strategies;
- Access to a highly trained personnel;
- Access to intellectual property;
- Enhanced stature in academia and industry, leading to recruitment of key employees

Academia

- Sustained corporate support of research;
- Enhanced appreciation of industry's needs with respect to economics, marketing, environment, and risk;
- Expanded research and learning opportunities for graduate students;
- Increased publications and patents; and

1995 Council on Competitiveness Workshop Report ISBN: 0-309-59022-1

What Really Drives Academia to Collaborate?

Top Tier Universities
Attract the Lion's Share of
Government and Non-
Government R&D Funding

1	MIT	16	UTexas
2	Berkeley	17	UWashington
3	Harvard	17	Illinois
4	Princeton	19	Northwestern
5	Caltech	20	Duke
6	Stanford	20	Johns Hopkins
7	UChicago	22	Carnegie Mellon
8	Yale	23	Minnesota
9	Cornell	24	North Carolina
10	UCSD	25	Brown
11	Columbia	26	UC Irvine
12	Michigan	27	NYU
13	UCLA	28	Virginia
14	Penn	29	Purdue
15	Wisconsin	30	Arizona

Top Tier Status for U. T. Dallas

In the report, the Washington Advisory Group said it agreed with U. T. Dallas Provost Dr. Hobson Wildenthal's assessment that "UTD must double the size of its research-active faculty and its current faculty members must double their research efficiency" in order to achieve the \$100-million goal. Noting that UTD estimates that it will need to recruit 250 new faculty members in science and engineering, each of whom would have to bring in an average of \$300,000 per year in research expenditures, the report said, "We believe tuition increases represent the only realistic possibility for funding for the salaries for these individuals.

A major challenge is its inability, so far, to attract significant levels of external research funding

What Really Drives Industry to Collaboration?

R&D Globalization

Faster Paced Change

Innovation!

Shift of Corporate R&D
to Operating Units

Shift of Long-Term
R&D to Incremental
Improvement

Invention Is Not Innovation

- Originally, the mission of the IRI was, “To enhance the effectiveness of industrial research.” In December 1994, the goal was changed: “To enhance the effectiveness of technological innovation in industry.” In the 1995 IRI annual report, IRI president Charles J. Bishop stated:
- *The old way of doing business no longer works! And this includes research and development. We no longer talk about R&D we talk of technology. We no longer talk of isolated units of researchers pursuing independent ideas of intellectual interest; we talk of results-oriented research, and integrated high-performance teams that include engineering, manufacturing, and marketing.*

PHILIP H. ABELSON, IMPACTS ON US TECHNOLOGY IN A CHANGING WORLD

Finding Effective Collaborations Requires an On-Going Process

There Are Collaborations

And

There Are Collaborations

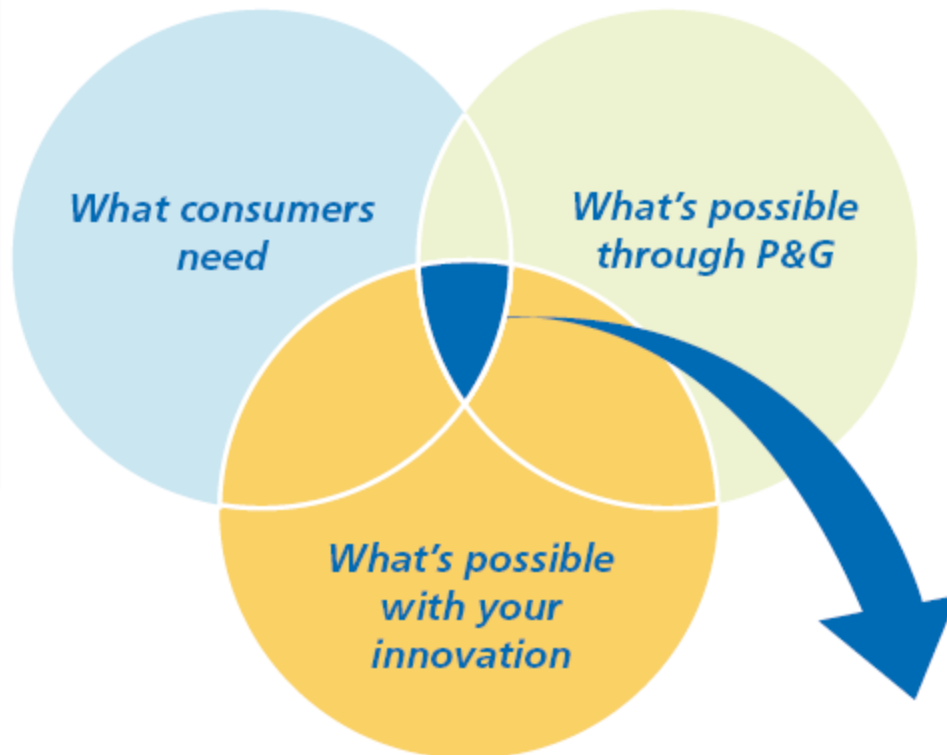
Organizations Requirements

- Business and technical champions who have a vested interest in the success of building collaborations.
- Senior management who provide adequate financial, human, and capital resources.
- An infrastructure to execute, manage, and evaluate.
- Intellectual property and publication policies that balance industry's need to secure patent protection with the university's obligation to disseminate knowledge freely.
- Agreements that are tailored to the size of the project and to the needs of the parties.

Individual Requirements

- Mutual perception of value by each partner.
- Mutual appreciation of organizational differences, missions, motivations, and environments.
- A shared agenda and desire to work together.
- The ability of all partners to see beyond the bounds of individual specialties.
- Expectations of and efforts to foster a win-win outcome by all parties.
- Frequent and clear communication at all levels of the partnership.

P&G's Connect and Develop

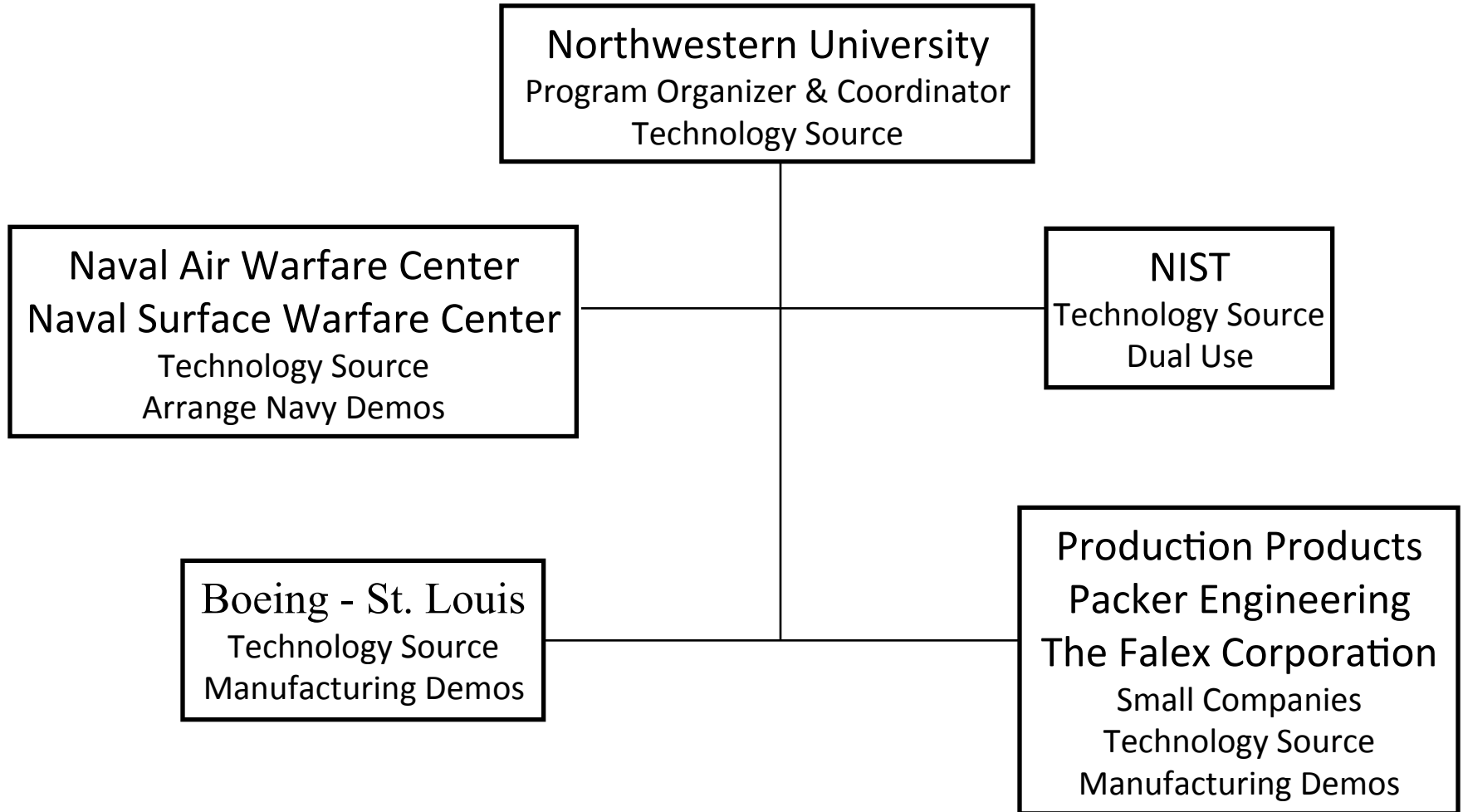


- For Each P&G Researcher 200 Outside of P&G Have Complimentary Skills
- 35% of P&G Products and 45% of Initiatives Have an Outside Element
- Innovation Success Has Doubled In Six Years

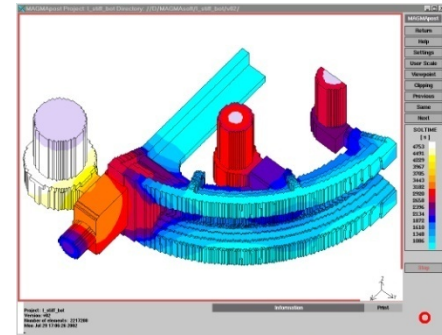
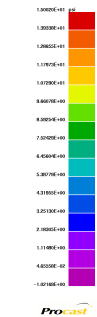
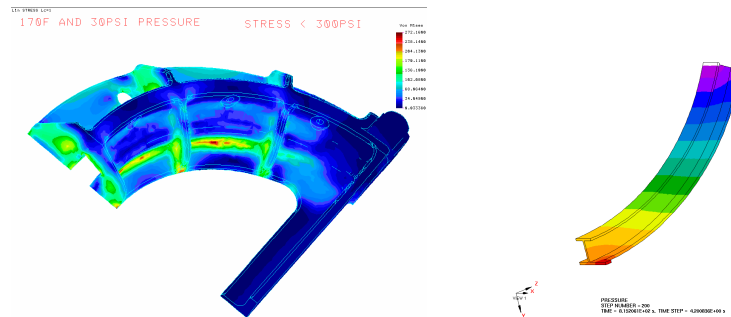
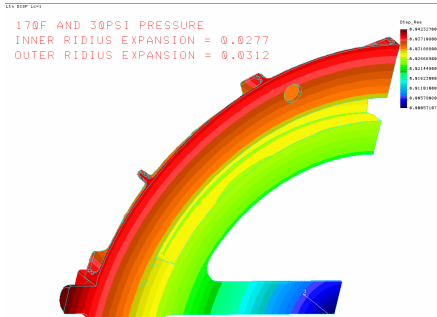
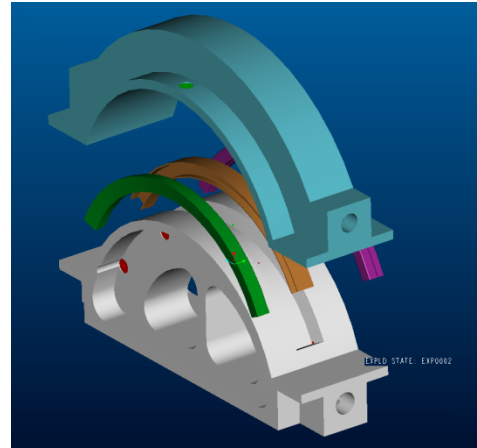
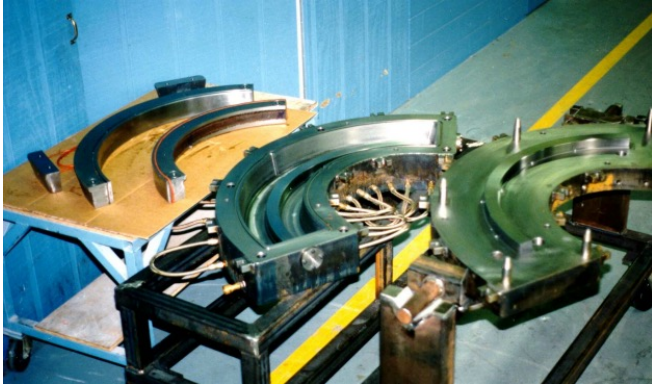
Northwestern University's Industrial Research Lab (BIRL)

- Professional staff dedicated to applied R&D.
- Grew to \$10 million of funding from non-traditional (i.e. truly new) sources for Northwestern, and 90 staff members.
- Provided the University with a staff with industrial experience (ability to network, know-how of industry, etc.)
- Provided a means for the faculty to participate in time-critical and mission-critical work.

Advanced Materials Intelligent Processing Center – a \$15.5 Million Multi-Year Collaboration

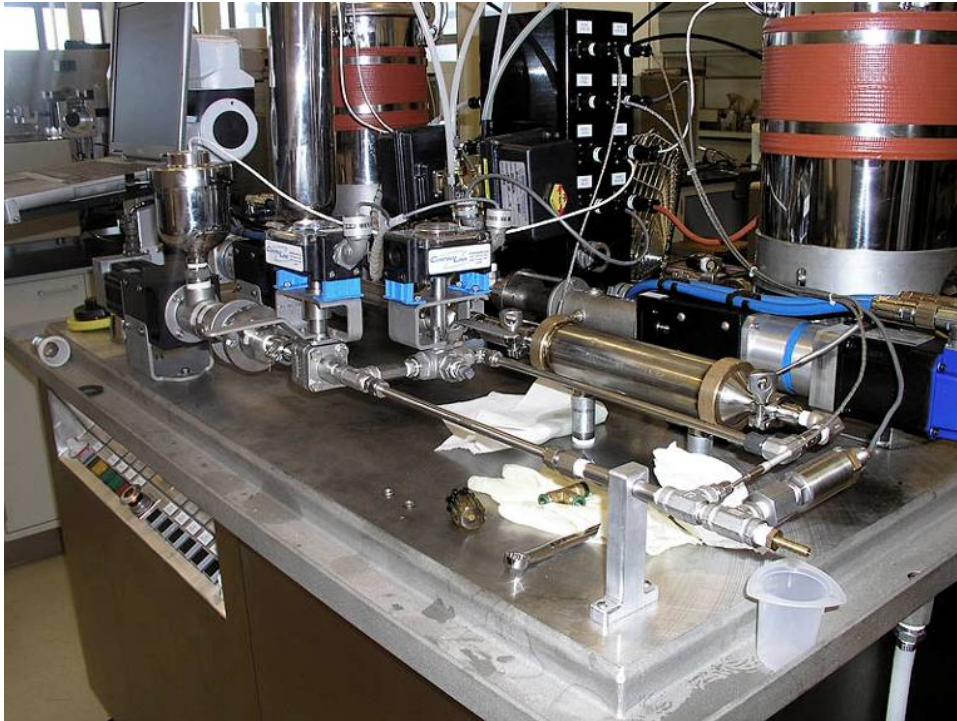


An Government - Industrial Collaboration Through The Advanced Materials Intelligent Processing Center Pioneered Resin Transfer Flow Modeling, Mold Design, Cast Tools



An Industrial Collaboration Through The Advanced Materials Processing Center Developed an Innovative Resin Injection System

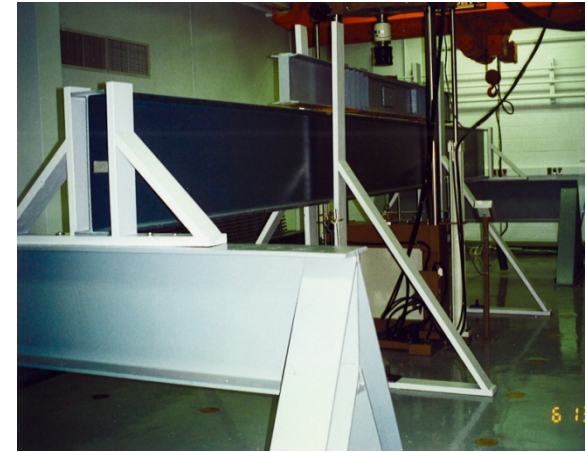
Spotlight Business Consulting



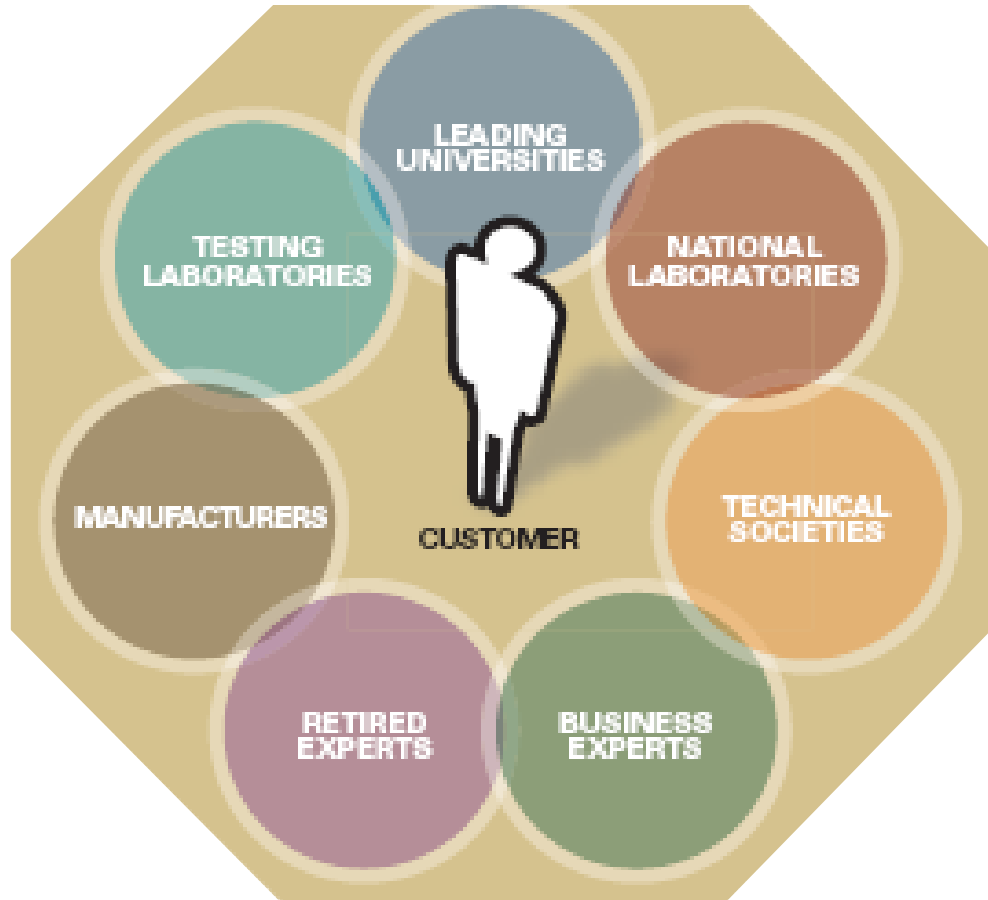
TRP Composites in the Infrastructure

- A \$2.7 million collaboration of Northwestern University, the University of Kentucky, the City of Chicago, and Morrison Molded Fiberglass
- Funded under the first round of the highly competitive Technology Reinvestment Program (about 13 proposals funded out of over 500).
- Pioneered design and construction of a composite pedestrian bridge and of composite sidewalk decking on lift bridges (see next slide).
- Pioneered design of hybrid graphite-glass fiber composite I-beams.
- Demonstrated long-term strain-gauge monitoring of composite structures in the infrastructure.

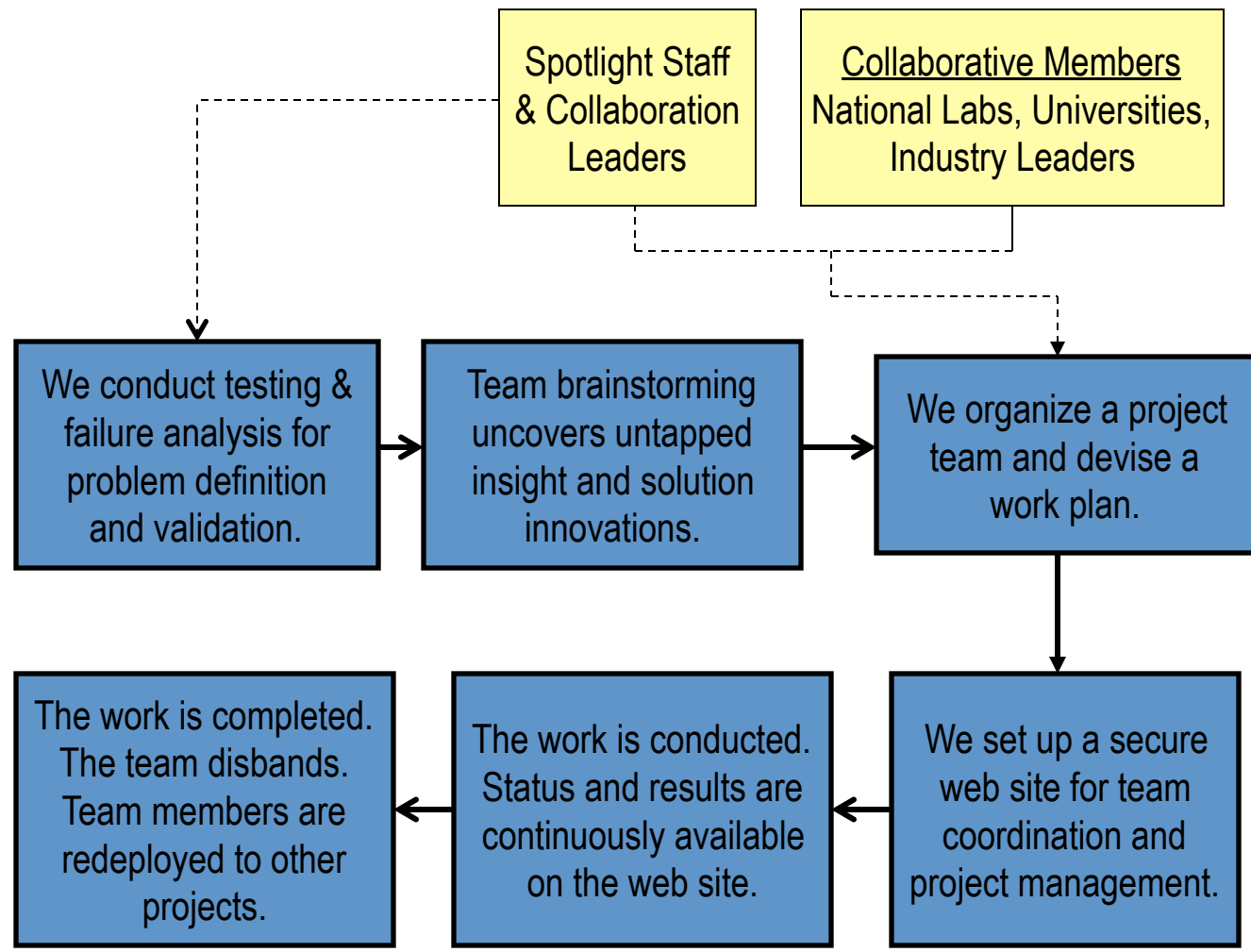
An Industrial Collaboration Built a Composite Predestrian Bridge



A Collaborative Model



A Brainstorming and Collaboration Process That Drives Innovation



Spotlight Business Consulting

Spotlight Business Consulting was formed with a mission to provide businesses with consulting that is informed by a focus on execution. These service offerings address the fact that vision, strategic plans, staffing and people development, and operations and budgeting – the core processes of businesses – have to originate at the very top and travel like a wave through the entirety of the hierarchy of the organization. These service offerings also address the fact that what gets done on any given day is the result of a myriad of decisions that have been made throughout the organization, so superior execution requires superior decision-making. These service offerings also address the fact that ambiguity and insufficient information and insight are the norm even in businesses with superior performance. What distinguishes businesses with superior performance is the way they overcome ambiguity and insufficient information and insight. It used to be that we had access to far too little information, but ironically today, we have access to far too much. Finding and applying all of the relevant information is an important part of overcoming the ambiguity that we as business leaders face in every important decision we make. Rather than simply apply our extensive experience, we are unique in offering you a contemporary, information-driven consulting process, every aspect of which is informed by a focus on execution.

The Author

The Author and SpotlightBC leader: John Fildes, Ph.D. is uniquely qualified through experience and training to provide insight and consulting on establishing an execution environment to improve outcomes and cut costs in organizations, for which John has created Spotlight Business Consulting (SpotlightBC) as a vehicle to bring this experience to companies, academia, insurers and litigators, and industry. Like John, SpotlightBC provides consulting by people who have actually led organizations, made the decisions leaders have to make and faced the consequences they face. Our consulting is insightful, pragmatic, useful, and highly valued. John's credits involve creation and management of an extensive and impressive list of ventures, which include:

- *CEO of an engineering services firm of over 100 staff members and \$18 million in revenues.*
- *Start-up a science and engineering consulting firm that grew to over \$6 million of revenues and over 25 people that serves industry, litigators, and insurers; of a model-based product design firm that achieved a run-rate of \$3.5 million serving an impressive list of large companies and entrepreneurs, and that did this operating purely from cash flow; and of a 501(C)3 not-for-profit research institute that has led a multi-million dollar collaboration of academia, the Government, and the small arms industry, leading to a thrust to establish a Government Center of Excellence.*
- *Leader of a Northwestern University research group with more than 30 staff members. John's work led to establishing Northwestern University's federally funded Advanced Materials Intelligent Processing Center, which was a highly successful collaboration involving academia, industry, and the Government. John served as co-Director*
- *John has organized and conducted over \$27 million in funded projects including consulting, research, development, litigation expert witness investigations, and collaborations involving Government, companies, and universities. He has 50 published papers, reports and presentations, and 3 patents.*