Research in Corporate Labs

David Waltz
President
NEC Research Institute

Q: What percentage of the effort at your lab is research (as opposed to advanced development or development)?

A: About 30% of our budget goes to long-term research ("Seed Projects").

Another 25% goes for "Targeted Science Projects," research projects that have demonstrated some proof of concept, but still require solution of open scientific problems.

The rest (45%) is devoted to "Technology Group Projects", consisting mostly of advanced development with perhaps 10% for development.

Q: What steps are taken to ensure that this research will be of the highest quality?

A: For the Seed Projects and Targeted Science Projects, publication in refereed journals and high quality conferences is expected, along with patents.

All projects are also reviewed periodically by an Evaluation Committee, consisting of NECI technical management, VPs of NEC US and Japan labs, and representatives of the US business strategy office.

Q: How is this research effort justified to the parent company?

A: All work needs to have a business goal/purpose. For the longer range work, purposes are of necessity broader and less specific. The general justification is future competitiveness in some area important to NEC.

Q: What do you do to assess whether or not the research is likely to benefit the company in the long run?

A: In addition to the meetings of the Evaluation Committee, NECI management is expected to create documents and presentations that resemble business plans, including technology trends, market projections, plans for collaborations/technology transfer, etc.

Some projects are proposed for trial marketing in the US (generally with outside partners), and these projects will be judged by their profitability.

Q: How is the research effort paid for?

A: Until recently, all our funding came from corporate headquarters via NEC Central Research Labs. Now about 5% comes from government agencies (US and Japan). Most outside funding is for basic work, as a subcontractor to universities. An addition small amount comes from patent and software royalties. We expect these latter two categories to become more important in the near future.

Q: If you could change any of the above at your lab, how would you change it?

A: We would like to have more contact with customers and business units. This is difficult because most customers are in Japan, and because the Central Labs – not the business units – are our "customers".

Problems: Without customer contact it's harder to pick research areas that customers actually care about – important for choosing good projects and motivating scientists. It's also hard to get real data.

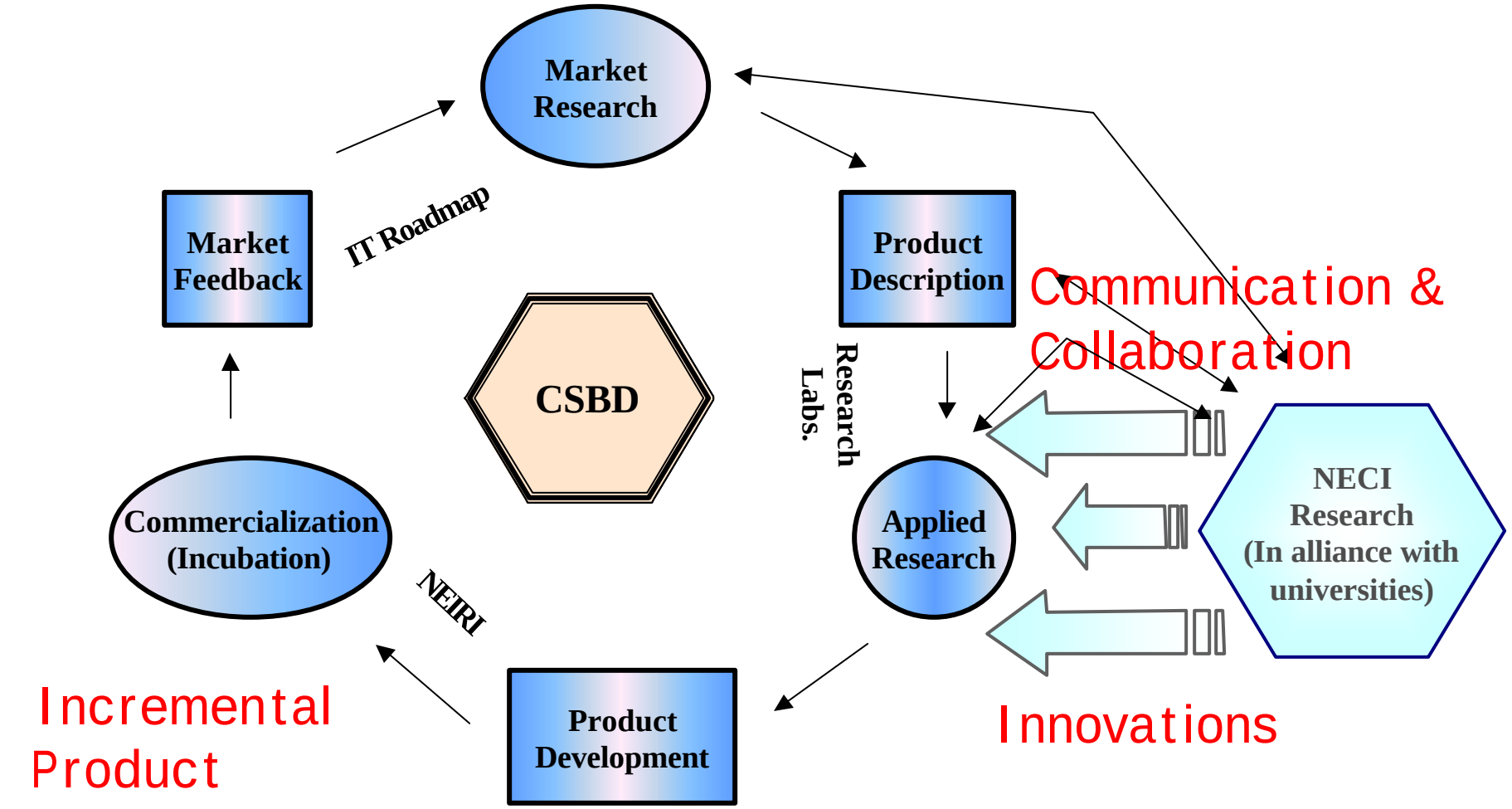
Advantage: We aren't captives of the business units.

One reason for doing US trial marketing is to make it possible to work with US customers (in an area premature for Japan), with the expectation of later transferring a mature product/service to Japan.

Q: Am I asking the right questions or is there something else that is more important relative to this topic?

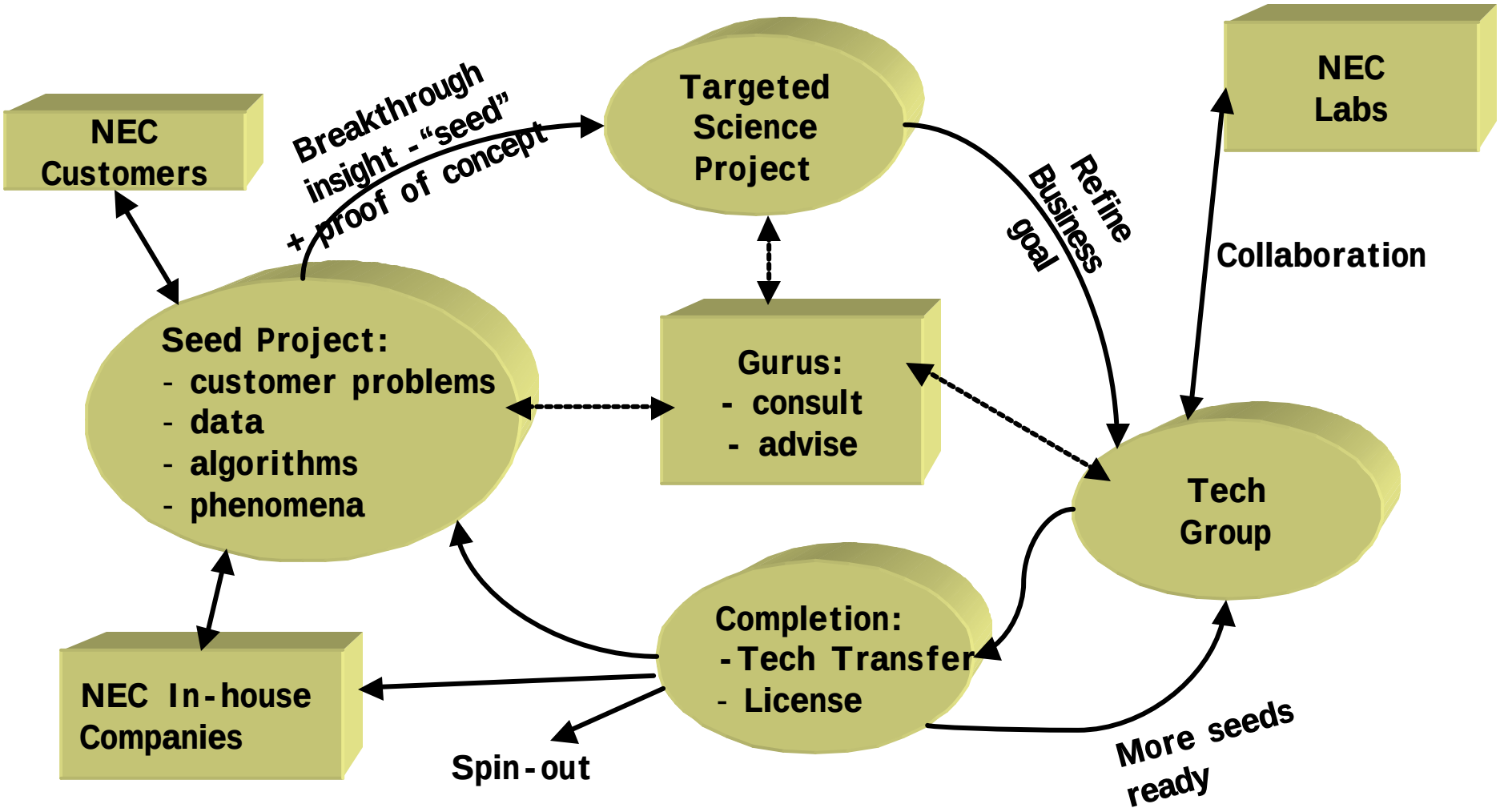
A: It's not clear that NECI's current situation can continue indefinitely if the US, Japanese and world economies continue to stagnate, and commoditization continues to erode company profitability (in PCs, telecom, DRAM, open software, etc.). As companies with long research histories (e.g. Lucent, AT&T, Xerox, Sarnoff, Philips, etc.) cut research, research (especially basic) becomes a more tempting target for the axe at companies that still support it.

Model for NEC-NECI Tech Transfer



Adapted from CSBD presentation

R&D Pipeline Paths for Scientists



Breakthrough technologies and insights rarely come from managers!

Obstacles to Tech Transfer

- Distance
  - Incompatible time zones
  - Shortest trip is expensive and time-consuming
- Language
- Not-Invented-Here syndrome
  - Natural attachment to one's own ideas
  - Competition for credit & funds
  - Sense that using NECI ideas demeans CRL (Central Research Labs)
- CRL personnel, especially in CS, are fully committed to development projects
  - Little time to read NECI Tech Reports & papers
  - Little opportunity to take on new tasks, even if significant & interesting

NECI Strategy for Tech Transfers & Collaborations

- Formed NECI Research Strategy Committee including Technology Development VP, NEC VPs, Business Development people
- **Push**: Hired NECI Development VP to be responsible for Tech Transfer & Collaborations, specifically:
  - Identify promising seeds & key people at NECI & NEC Labs
  - Assign responsibility & provide incentives to researchers at NEC Labs & NECI to generate collaboration plan proposals
  - Evaluate proposals & assign budgets
  - Coordinate, track progress & adjust incentives
- **Pull**: Assigned liaisons at NEC Japan to provide "pull" for projects – their job success to be judged on their ability to move projects from NECI to NEC
- Successes must be win-win for both labs

NECI Incentives for Better Business Contributions

- Instituted “carrots” for key people – “sticks” would drive them (and others) away – voluntary participation strongly preferred strategy
- Increased bonus potential for NECI Tech Group participants
- Enriched patent award program
- Instituted program to share royalty revenue
- Trying to extend to sharing of spin-out equity
- Instituted financial incentives & using management pressure to encourage scientist visits in both directions. But --
  - Difficult and expensive to spare key people
  - Extended visits very difficult for people with children and/or working spouses