

FROM CONCEPT TO COMMERCE:
NEW INNOVATION MODELS SPUR COLLABORATION AND GROWTH



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Successful companies are partnering more aggressively than ever to satisfy the intensifying need for innovation. An openness and interdisciplinary spirit previously unseen, both within and among companies, is giving innovators the tools they need to capture the spoils obtainable through innovation leadership.

Some of the most advanced and successful companies, such as Sun Microsystems and PARC (Palo Alto Research Center Inc.), have been on the vanguard of applying new innovation models, ecosystems that rely on multiple disciplines, including engineering, science, business strategy, ethnography, economics, and law to generate and implement technologies in markets where they can achieve the highest ROI and best satisfy customer needs.

THE INNOVATION CHASM

That said, the majority of entities doing technology work still employ a more traditional approach of innovating internally, fearful of losing a strategic edge by sharing intellectual property with others, including potential competitors. Within companies, silos stifle innovation, knowledge sharing, and creativity that would otherwise advance technologies, processes, and business models.

In many companies, a chasm exists between product marketing and R&D. R&D views marketing people as unusual entities working on the other side of the curtain, and marketing people tend to think that people working in R&D have their heads in the clouds. “It’s unfortunate, and it tells me that the people on both sides of the equation are failing to have the conversations that they need to have,” says David Douglas, Director, New Technology Adoption at Sun Microsystems.

At the same time, there’s evidence that corporate entities such as Sun Microsystems are increasingly looking outside their own walls for what is possible. “The pharmaceuticals industry is an example of where that trend has taken hold and we’re seeing more of it in other industries as well,” says Jennifer Ernst, Director of Business Development at PARC. The trend has created demand for research and business services from entities such as PARC and Sagentia, which companies call upon to help them address specific market opportunities.

While the nation’s political and corporate leaders increasingly look towards innovation as a driver to revitalize the national and world economy, a swath of the most innovative companies are ready to take advantage of, and potentially profit from, these new innovation models.

“At Sun, we invest in medium and long term horizons at the same time that we are putting innovative products into the market,” Douglas says. The proof of that is in the nature of our products. We produce these great products that are very well suited for the space they are about to occupy, and we do that by figuring out what the options are. And then we drive those options to ground, making sure they have value to our customers.”

Sun's innovators eagerly draw on services from a well-established innovation ecosystem and realize its vitality in generating breakthrough technologies and products.

“PARC helps enable options and gives them legs in that middle space of innovation, where a set of concepts has a value proposition as part of a suite of technologies, but it still has some time to enter the market. We obtain seeds of innovation from PARC and active support for execution in the middle phase. We're leveraging pure intellectual property, capital, complementary assets, innovations, and ideas. PARC is not only in contact with our business proposition, but they are in contact with the technical value of what we're providing in multiple different disciplines.”

FROST & SULLIVAN INNOVATION SURVEY

A recent Frost & Sullivan survey produced by the Growth Team Membership and Technical Insights practices cited the need for product and service innovation as the top priority among a ranking of business environment factors affecting new product development strategy.

The perceived need to innovate significantly outranked the global economic downturn and the increasing demand for sustainability initiatives as a top-of-mind issue for innovators.

Corporate leaders working in innovation functions that are looking beyond the current downturn and towards a future shaped by innovation will be best positioned when the economy recovers and ready to produce lower cost, differentiated, and more profitable products that generate desirable levels of revenue, and provide features that meet customers existing and future unmet needs.

Selecting a winning technology or suite of technologies demands a rigorous process. Immediately, you have to ask whether the technology is going to be applicable to solving a problem, how complete is the offering, and what level of risk is associated with it. Those responsible for innovation must not only evaluate competing offerings on their own evolutionary paths, but also assess the technology ecosystem and the participants that are bringing it to life. They must prepare a careful calculation of the required investment and a valuation of the offering, which is typically expressed in revenue terms, but is sometimes also expressed in terms of its strategic value.

When technology features match market needs customer benefits are generated.

The computer industry, for example, requires greater bandwidth between memories and processors or between logic devices and components of memory. On the printed circuit boards of today's computers, information and electrical power travel over copper wires between CPUs, memory and I/O devices. The wires and connectors they use (such as pins and solder bumps) are the main speed bottleneck in these systems and are limiting factors in the growth of computer systems. Sun Microsystems' innovators are solving the bottleneck challenge with next generation proximity communications, which seeks to rid the systems of the wired connections, allowing chips to connect directly to each other via

microscopic metal pads. Ridding the system of wired connections allows for an order-of-magnitude improvement in each of several dimensions – density, cost, speed, latency, and power demand – providing features that satisfy these needs and can provide a substantial leap forward in computing and communications.

ECOSYSTEM MODEL ADVANCES COMPUTING

Sun innovators were hard at work on a solution when they realized that they needed a way to mass-fabricate electrical connectors, or springs, between silicon chips and the substrate that connected them to the outside world. The technology teams at Sun were familiar with technical papers published by PARC about a technology called ClawConnects that could be tried out to solve the technical challenge. Not only were ClawConnects a potential solution for connecting chips at a microscopic scale, they also presented other benefits not realized by any other technology available: the ability for chips to be put in place and be taken apart without damage to the chip or substrate. “It was a worthy enough idea with enough applicability that we wanted to learn a little bit more about it and engage with one of the engineers who had done the early work at PARC,” says Jim Mitchell, Vice President of Sun Microsystems High Productivity Computing Systems (HPCS) Research and Development Program.

Sun sells high performance servers from the volume market to the very high enterprise markets and this technology is likely applicable throughout that range. As it’s a platform technology, the ClawConnects could be applied whenever chips need to connect in a system, which opens up the realm of use not only at the high performance end of the computing, but in a range of electronic devices down to hand-held mobile phones and personal assistants.

If the project works—and the innovators have high hopes that it will—they will be able to relatively easily change the size and scale of computer systems, package more chips inside smaller spaces, and drive processing efficiency in proximity communications applications.

Sun Microsystems’ innovators give credit to PARC for the manner in which the company created an open and trusting work atmosphere.

“Over the last 5 to 6 years we have come a great distance in terms of recognizing what it takes to accomplish the vision for making a business from research, generating relationships with customers, and understanding how they value technology,” says Mark Bernstein, CEO of PARC. “By customers, I mean partners and clients as well as the ultimate paying customer. We are informing researchers about what it means to create an impact in the world from the ideas they create.”

At the core of this open relationship is the knowledge from both teams that it is impossible for collaborators to insulate and protect their IP.

THE MOST INNOVATIVE EMBRACE COLLABORATION

The most innovative companies—those that consistently outperform financially relative to industry averages—are those that openly collaborate with competent partners in mutually

beneficial relationships. BusinessWeek's list of top 50 innovation companies (2008) has Apple Inc., Google, and Toyota Motor Company claiming the top three spots. Each of those innovative companies has products or services that have emerged from a number of participants in a value chain, using technology, expertise, and IP from each partner in a cohesive flow of ideas. Apple's iPod, for example, is made from hundred of parts, most invented and manufactured by companies all over the world. Google collaborates with partners (companies, universities, and institutes) to enhance its product offering. Toyota's collaborations are multifaceted, involving suppliers, start-ups, universities, and incubation hubs, resulting in the manufacture of better and more durable cars that customers want. "When you take the ecosystem view, the role of internal R&D tends to change," says Ernst. "It's not about trying to invent it all. Instead, your senior technical people become both inventors and scouts. They're among the best people in any company to help marketing put together innovation teams that can meet the real customer need, regardless of whether everyone works for the same company."

Innovative collaboration is highly applicable to smaller start-ups as well as global Fortune 500 companies, and companies in between. SolFocus Inc., developing concentrator photovoltaic (CPV) technology which combines high-efficiency solar cells (approaching 40%) and advanced optics to provide solar energy solutions, literally started in a garage with initial design and prototype work.

Their CPV system uses inexpensive optics such as mirrors or lenses to "concentrate" or focus light from a relatively broad collection area onto a much smaller area of active semiconductor PV material. The approach is an effective, practical way to keep solar cell conversion efficiencies high while keeping semiconductor material costs down when compared to traditional flat-plate PV systems. The company, as a startup, naturally needed help in a number of areas, including material science and optical design, to make all the components work at optimum efficiencies.

"SolFocus is very collaborative in its approach," says Gary Conley, CEO of SolFocus. "We try to put great minds together; we leveraged the resources of PARC to get to market much faster with a reliable product. It is about exploiting technology rather than inventing it all."

At the time that SolFocus was getting started, PARC was launching a greentech initiative taking advantage of internal expertise in optical system design, optoelectronics, and advanced materials and processes for electronic packaging – and partnering with SolFocus was a natural fit. "Our small size contributes to the collaborative nature of our organization, both within PARC and with clients," says Ernst. "It also means it is very easy for us to foster cross-disciplinary teams to create projects that can have some flexibility and span multiple disciplines."

In addition to leveraging PARC's technical capabilities, working closely with PARC enhanced SolFocus' credibility in the eyes of investors. "There was a financial element, too," says Conley. "Working with PARC certainly helped our image and ability to raise funding."

The first installations of SolFocus' modules were carried out last year in Spain, proving the commercial viability of the CPV system. In the US, the company expects demand to increase in the coming years with new initiatives promoting renewable energy, with the first

shipments expected within 12 months.

What Sun Microsystems and SolFocus have done differently, which is a direction many in the industry are heading, is sourcing, quickly and readily, people who will help them figure out solutions to get them there faster and cheaper, and with a better product.

Despite the importance and benefits realized, many companies concede that external collaboration is practically hard to accomplish. It is, therefore, important to consider some best practices when seeking an external partner to make sure a good fit for your company.

BEST PRACTICES

Collaboration with an external partner has many advantages. It is critical, however, to find a good fit. To find a good fit, companies need to evaluate partners based on accepted best practices to ensure a productive and mutually beneficial outcome of proposed projects. Some of these best practices are listed below.

Excellent track record

A company with a successful track record in collaboration is a better choice than a company that does not. A careful analysis of case studies of previous engagements is one way to evaluate a partner, specifically emphasizing projects similar to those you wish to pursue. Companies with good track records will also have a good reputation in the industry, and will be actively engaged in their markets (attending tradeshow or conferences, routinely giving talks, and publishing their latest research findings, for example).

Technical capability

Technical capability and a strong research and development program, supplemented by a strong intellectual property (IP) portfolio, are all important factors when choosing a partner. The objective of partnering with a technically capable partner is faster time to market--from concept through prototype to market. It is also important to note that you or your partner should not see each other's technical capability or IP portfolio as competition, but as an IP resource that both companies can jointly tap to find the best solution to the problems at hand.

Multidisciplinary expertise

Many companies, when seeking a partner, are narrowly focused. They identify a problem, and seek partners that can help them find a solution to that specific problem. Usually, no novel innovative ideas are generated beyond what is necessary. Many companies work with universities and research institutes, where a subject matter expert helps identify a solution. However, it has been confirmed that studying a challenge from many perspectives and through a multidisciplinary team yields the best results. Seeking a partner with a strong multidisciplinary expertise--not only in the technical sense, but also business development or market experience--generates the best outcomes.

Ability to adapt

For a constructive collaboration, projects should have clear, precise, and measurable outcomes. This can be done phase-by-phase with specific milestones clearly known at finite periods of time. However, this does not mean the relationship has to be inflexible. Flexibility is important when unexpected outcomes arise. A partner should be able to adapt to new directions as progress is achieved, and the two companies should be open to revisit and rewrite objectives if the need arises.

Human element

The human aspect of collaboration is often neglected but should be an important factor when making a decision about potential partners. Communication between individuals is key, as people in companies need to talk to each other and not past each other. An open, honest engagement occurs when both companies are seeking the same goal and recognizing that neither company is going to succeed alone. It needs to be a true collaborative effort by all individuals in the team. Finding a partner who has experience working with different company cultures is a plus.

CONTACT US

Beijing
Bengaluru
Bogotá
Buenos Aires
Cape Town
Chennai
Delhi
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Frankfurt
Kolkata
Kuala Lumpur
London
Melbourne
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Mumbai
New York
Oxford
Paris
San Antonio
São Paulo
Seoul
Shanghai
Silicon Valley
Singapore
Sydney
Tel Aviv
Tokyo
Toronto
Warsaw

Silicon Valley
331 E. Evelyn Ave.
Suite 100 Mountain View, CA 94041
Tel 650.475.4500
Fax 650.475.1570

San Antonio
7550 West Interstate 10, Suite 400,
San Antonio, Texas 78229-5616
Tel 210.348.1000
Fax 210.348.1003

London
4, Grosvenor Gardens,
London SW1W 0DH, UK
Tel 44(0)20 7730 3438
Fax 44(0)20 7730 3343

877.GoFrost
myfrost@frost.com
<http://www.frost.com>

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