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## **Tap into the "Creativity of the Crowd"!**

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### **Abstract**

Many papers inside and outside our industry have discussed tapping into the ‘wisdom of the crowd’ to meet organizational needs. Many papers have also discussed the need – and methods – to innovate. So perhaps we need to ask ourselves how we can tap into the ‘creativity of the crowd’ to better understand what needs to change, identify opportunities for improvement or new market spaces to explore, share technologies across disciplines and industries and attract new types of talent.

Cultivating and supporting innovation can be a significant challenge within any organization. Empowering people to generate new ideas should be a part of successful business organization. One should be mindful that innovation knows no boundaries and can happen for anyone at anytime. This becomes apparent within each of us when we ask “What if...?”

There are several challenges in capturing these innovative thoughts in the proper context and putting them in front of the appropriate audience. This includes creating a mechanism for stakeholders to share their ideas, a process for management review and monitor submissions, the ability to bounce ideas off the ‘wisdom of the crowd’ and tools to connect the R&D effort to stakeholders throughout the development process.

We have addressed this challenge through the creation of an IDEA system and using existing knowledge management tools to affect the development and commercialization process. The approach allows the entry and tracking of submissions through the process while maintaining intellectual property security.

This paper discusses cases where these new tools and processes effectively managed and nurtured innovation within and between product service lines. Typical barriers that have hindered end users from sharing innovative ideas will be highlighted along with solution measures utilized. Finally, areas of future exploration related to the effort will be identified.

### **Introduction**

Do you know those moments when you ask “what have we gotten ourselves into?” In late 2004, the management team of our division within a major oilfield service company challenged the marketing and knowledge management (KM) team to leverage our existing KM tools and improve the innovation process.

A senior manager had read an article on James Surowiecki’s book “Wisdom of Crowds”<sup>1</sup>, thought it made a lot of sense and wanted to see how our KM tools could allow the “crowd” of our employees to interact and collaborate on new ideas that could lead to new products and services.

This sounded like fun and we took it on with a passion. Little did we realize the scope of the challenge. Three years later, we continue to explore and expand on our successes surrounding innovation. The challenge was generally aimed at improving the way new products are brought to market by filling gaps in the existing Innovative Product Commercialization (IPC) process (our company’s product development and commercialization process) with a specific goal of greatly increasing the number of ideas filling the IPC pipeline.

We’re not alone. In the last few years, several books, papers and presentations inside and outside our industry have discussed tapping into the ‘wisdom of the crowd’ to meet organizational needs<sup>2,3</sup>. Many more papers have also discussed the need – and potential methods – to drive innovation and research within the upstream oil and gas industry<sup>4,5,6</sup>.

Some elements of our approach we discuss in this paper (such as the use of an idea collection system) have been co-developed or adopted by other teams in the company. Other elements discussed (such as the use of innovation challenges and events) can be adopted from others inside and outside the company. This is NOT to say that the company doesn't have an overall innovation and commercialization process; each sub-unit has the freedom to optimize the way it approaches certain aspects of the overall process to meet specific customer and organizational needs.

A key element of our approach has been to build upon our existing knowledge management (KM) tools and the existing community of practice that supports our product service line. In fact, this community provides the 'crowd' we reference throughout this paper. Because of its importance to our topic and experience, our description of KM is critical here.

While there are many definitions for knowledge management, our company prefers "a systematic approach to getting the right information to the right person at the right time." This is an adaptation of the American Productivity & Quality Center's (APQC) definition<sup>7</sup>: "A set of strategies and approaches to create, safeguard and use knowledge assets (including people and information), which allows knowledge to flow to the right people at the right time so they can apply these assets to create more value for the enterprise." Both of these definitions can be read to include our effort to use KM to improve our ability to innovate – when you consider the "right information" as ideas, (in)validation and improvement of those ideas or customer insight.

The company's KM approach is centered on developing and supporting communities of practice that meet the needs of the organization. While providing access to common portal processes and tools, it is believed each community has unique needs and distinct business objectives. At the heart of these communities is the ability to communicate and collaborate around relevant topics. The collaboration tool enables anyone in the company to:

- Ask a question
- See the original question/issue and all replies in one place
- Reply with an answer or opinion
- Learn on demand by searching previous discussions and accessing managed content
- Push knowledge (a best practice, an idea, etc.) proactively to the community

Issues involving one or more communities can be shared to increase collaboration and gain additional perspective. While these discussions typically involve technical or operational problem solving related to the communities, we see an increasing amount of collaboration occurring around planning, strategy and innovation.

Dedicated knowledge brokers for each community provide full time administration to facilitate that community's KM effort. The knowledge brokers' primary responsibility is to oversee the collaborative discussions. Essentially, they ensure questions receive answers, issues are resolved, and stakeholders are made aware of developing challenges, solutions and opportunities. Several communities' knowledge brokers also administer their service lines' idea collection system (to be discussed in this paper).

Our community is among the first in the company to pioneer the use of KM – specifically collaborative activity – to proactively share market intelligence, collection and validation of ideas and opportunities for new or adapted technology and improved sales force and marketing effectiveness<sup>8</sup>... all of which are critical in driving innovation and commercialization.

### **Need for Innovation**

In the bigger picture, innovation – in its many forms – is necessary to improve effectiveness and efficiency in any industry. In our industry, innovation is required to meet increasing global energy demands, develop technically and commercially challenging fields<sup>9</sup> and ultimately higher profits from competitive advantage and differentiation from peers.

Put another way:

*Whatever made you successful in the past won't in the future.*  
- Lew Platt, former chairman and CEO of Hewlett-Packard<sup>10</sup>

### **Wisdom of the Crowd**

So just what *is* the "wisdom of the crowd", what value does it provide and when should we use it? The best description comes from James Surowiecki<sup>1</sup> himself:

*We generally have less information than we' like. We have limited foresight into the future. Most of us lack the*

*ability – and the desire – to make sophisticated cost-benefit calculations. Instead of insisting on finding the best possible decision, we will often accept one that seems good enough. And we often let emotion affect our judgment. Yet despite all these limitations, when our imperfect judgments are aggregated in the right way, our collective intelligence is often excellent. This intelligence... (is) what I'll call “the wisdom of crowds”*

Surowieki argues that collective intelligence will provide better answers more often than answers from any one person or small group of people. This may sound counterintuitive, but the root of his argument is that a diverse group (the larger the better) has access to *more* information and can therefore make a better aggregate decision. He states the wisdom of crowds can be applied to complex problems in three broad categories:

- **Cognitive problems** – problems that (will) have definitive solutions
- **Coordination problems** – problems that require individuals in a group to find ways to coordinate their behavior with others trying to do the same
- **Cooperation problems** – problems that require self-interested, distrustful individuals to work together

In any given problem, an individual (or several people) in the group may have a better (more accurate) answer than the whole group. But no single person consistently outperforms the group. Think of how this might apply to your organization (we did)... if the same small group (management, experts) makes decisions based on their deep but narrow knowledge, will they always make the best decision? This isn't to say that experts' knowledge isn't as valuable as that of non-experts (it is!), but going to a larger group increases the amount of knowledge available and the overall decision is generally better.

We're not here to argue that most decisions should be made by the collective organization... there are very real limitations to effectively tapping the crowd. But it raises an interesting question: Can the crowd help with one of the most difficult problems facing any organization – development of new products, services and business models to meet the (often unknown) needs of customers, employees and other stakeholders? In other words... can we tap into the *creativity* of the crowd?

### Creativity of the Crowd

We think the 'creativity of the crowd' can be tapped if an organization has a platform to:

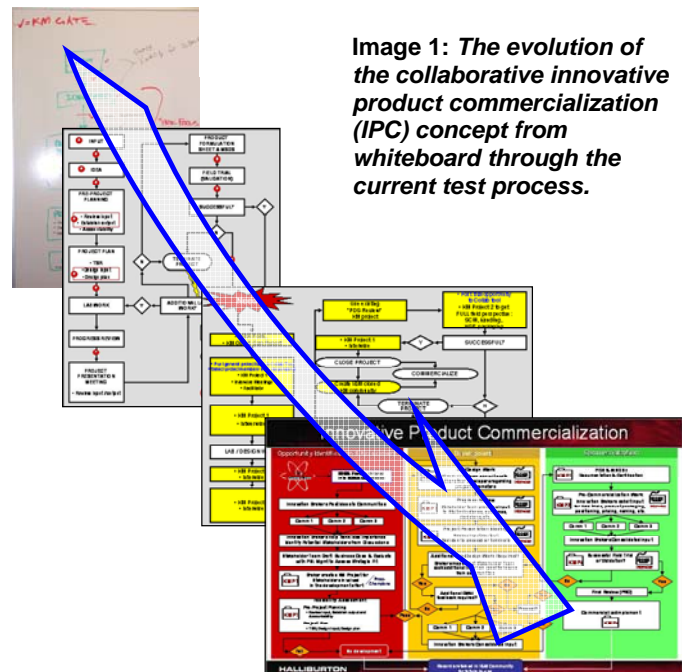
- Share opportunities / challenges to pursue
- Share potential ideas / solutions to those opportunities
- Collectively assess these opportunities and ideas
- Aggregate answers and recommendations to make decisions

When viewing innovation as complex problem solving, this platform fits well with Surowiecki's book. He believes that complex problem solving is a twofold process: Uncover possible alternatives then decide among the alternatives.

We have created and partially tested a platform to meet these elements. The first two steps (share) of our platform “uncover possible alternatives” and have been created and are in use. The third and fourth steps help decide among the alternatives. Our third step (assess) has been pilot tested but not fully deployed. The final step (aggregate & decide) has yet to be finalized.

### From Theory to Application: The IDEA System

We developed our innovation platform after reviewing the existing Innovative Product Commercialization (IPC) process for several weeks to brainstorm and refine potential applications and processes (Image 1). We proposed creation of an idea collection system and the use of existing KM tools at appropriate “stage gates” in the IPC process to increase volume, efficacy and velocity of communication and collaboration between R&D, stakeholders and the community at large.



**Image 1: The evolution of the collaborative innovative product commercialization (IPC) concept from whiteboard through the current test process.**



Image 2: IDEA banner on the KM page

Image 3: IDEA System interface.

To “fill the IPC funnel”, we developed an online form for employees to submit ideas: the Innovation Description & Economic Assessment (IDEA) system. Submitted IDEAs may be innovations (solutions) or may be opportunities to pursue/challenges to overcome. The system is easily accessible through the community KM website (Image 2).

The IDEA form (Image 3) allows any employee who, either through their experience of a market need for an improved product or as a result of their own ingenuity, identifies an opportunity or has an idea for a new or improved product, to drive innovation and the product development process. This focuses R&D resources on resolving critical challenges for operators and brings to light existing technology gaps.

Most IDEAs come from operations personnel with frequent customer contact who understand their customers' needs. Since any employee, in any location, can easily submit an IDEA, R&D resources are accessed more democratically and with less tendency for those operations physically or hierarchically closest to R&D resources to receive a disproportionate amount of attention. As a result, any employee in any location has the opportunity to influence the development of new products at the earliest stages, thus helping ensure that the interests and needs of their operations and customers are fully considered in the development process.

The initial system was a rough prototype rolled out to two service lines. While the system was rushed into production, it started collecting IDEA submissions and proved the concept. A third service line joined the effort and we developed a second generation system with a much improved interface, structure and reporting facility. Several service lines representing all company divisions adopted the updated system as a best practice and as a group we explored options for improving the effort further. Several commercial software applications were reviewed before the group agreed to fund and develop (in house) a third generation system that met most needs of all service lines. These needs include the ability to track status changes, record communications associated with the IDEA, attach documents and enable managers to subscribe to updates.

Submitters are asked to estimate the market size and identify potential target customers, customer value and value to the company. Some stakeholders believe these questions make the form too complex. We feel that the tool drives the behaviors we want to see in our employees (i.e. consideration of internal and external value versus random requests).

In the past, the technology group would receive requests via email, phone call and personal visits. By requiring an IDEA submission for every request, the management team can now track and monitor all requests and development statuses through one application. The requirement also drives further adoption and acceptance by operational managers as it simplifies the request process.

To date, the company overall has received more than 600 IDEA submissions. Of the 125-plus submissions received by our service line so far:

- 11 are in deployment or pre-commercialization.
- 13 are in development.
- 20 have been re-assigned to other parts of the organization (HSE, Training & Development, IT, Business Development, etc.).
- Over 20 have been accepted for further assessment.
- Approximately half of our submissions are shared with other service lines within the company.

IDEA submissions are reviewed by identified teams of product managers, intellectual property professionals, KM team members and other stakeholders. During the first review, most submissions are either rejected or accepted for further study based on projects already in development, feasibility, potential value and strategic fit. Submissions deemed as having low value, feasibility and/or fit are immediately rejected. Submissions deemed as having high potential value, feasibility and/or fit are immediately accepted for further study.

Submissions that have mixed potential (such as an IDEA that has high potential value but low technical feasibility or only a partial fit with the strategy) are posted to the KM community (or communities if the IDEA involves more than one service line) to gather feedback from ‘the crowd’. The collaborative KM discussions elicit additional information, wider review

and/or validation/invalidation by the greater organization. Feedback and user metrics from these discussions are recorded and used to further review the potential of the submission.

### Next Steps

While the review and assessment process has worked, it takes a significant amount of time and still requires decisions made by the same small group of managers and experts. An improved two-tier review and assessment process has been developed and is being tested. This improvement allows a small team to make quick and rough assessment of an IDEA's strategic fit, technical feasibility, customer (user) need and potential to add value. If the team's assessment score meets or exceeds the minimum threshold, the IDEA will be scheduled for a more rigorous review by a large, cross-functional team.

This is a step in the right direction... but does it go far enough to tap into the wisdom and creativity of the crowd? Can we bring in more people (or the community as a whole) to review, improve, assess and vote on more IDEAs? The tools can be adapted... but how can we manage the process and protect intellectual property along the way?

Other steps in the IPC process can also benefit from KM tools and community involvement. For example, if a submission goes into development, the users that posted useful feedback or exhibited passion in a collaborative review of an IDEA could be tapped to serve on a part-time project review team for that project. These teams may work on the business case for the project, serve as technical resources for R&D, provide "common sense" review of project progress, identify pilot test opportunities and champion the product when it moves into commercialization.

These teams could meet and collaborate virtually throughout the development process using KM tools and virtual meetings. Limiting the number of project members (but pulling the member from the broader organization) better protects intellectual property, improves accountability and gives ownership to the team.

We would also like to explore high-visibility events to both increase the number of IDEAs submitted as well as improve the validation process. Two other product lines have used innovation campaigns to challenge their employees to develop and submit IDEAs. These campaigns were championed by senior sponsors (such as the product line vice president), communicated through several channels and resulted in over one hundred submissions.

In a similar vein, we are intrigued by the potential of collaborative events like IBM's 'innovation jams'<sup>11</sup>. These online events last for a defined period and can use various KM tools (discussion boards, WIKIs, etc.) to drive discussion around *specific* strategic issues. Senior sponsors provide the topic(s) and their insight into the larger issues. All employees are enabled and encouraged to share their own ideas, thoughts and insights. The ability to rate solutions to tag issues of interest further improves validation and communication of collective decision making.

### Driving Knowledge across the Crowd

Our ability to innovate can be improved by tapping the crowd to better understand customer needs, collect market information and identify opportunities for improvement or new market spaces to explore. But it isn't just management and technology that needs to hear this information – the rest of the community needs to hear it, too.

Because KM tools enable two-way flows of information, they shouldn't be used to simply pull information from the crowd or to push management communications to the crowd. Community members (including management) should be encouraged to use these tools share information, knowledge and wisdom with each other.

Collaborative discussions can identify specific geographic or customer needs. This can include needs for new, improved or alternative application of technologies, services, processes, documents and knowledge/understanding.

Sometimes the specific needs are explicit. A customer may face an unconventional or new challenge and request a new or improved product or process to meet the challenge. If our local representative is not aware of an existing solution they can use the collaborative KM tools to draw on the combined global expertise of the organization.

Industry needs are sometimes dictated by changes in government legislation. Changes in environmental legislation are one area in particular which can drive the need for the development of new technologies. There have been a number of cases where new local needs in response to changes in environmental legislation have been communicated using KM tools.

Often the needs are implicit or are framed as something that "would be nice to have". When the knowledge brokers see repeated requests for a similar product or solution over months or even years, they can recognize the emerging theme. This is a distinct advantage of having human eyes reviewing all discussions.

These needs are frequently validated, invalidated or clarified by other members of the community. This can occur within a



discreet collaborative discussion or across several discussions. When there is a lot of discussion around a need, particularly with feedback from several regions and work with numerous operators, it becomes apparent there is an industry need.

Explicit needs and recognized themes are aggregated and communicated to management via regular reports (Image 4) and direct contact. The knowledge brokers recommend that users submit a formal IDEA form to better capture the explicit need. Either way, the management team and key stakeholders are made aware of the regional, customer or industry need.

Collaborative KM tools have demonstrated<sup>8</sup> their ability to do more than enable technical problem solving and ‘learning on demand’. In the context of this paper, by sharing market information and driving technologies across disciplines and industries, the community members themselves are gaining new knowledge they can use to be more innovative. We hope that this learning, development and encouragement to be creative will attract and retain the best talent.

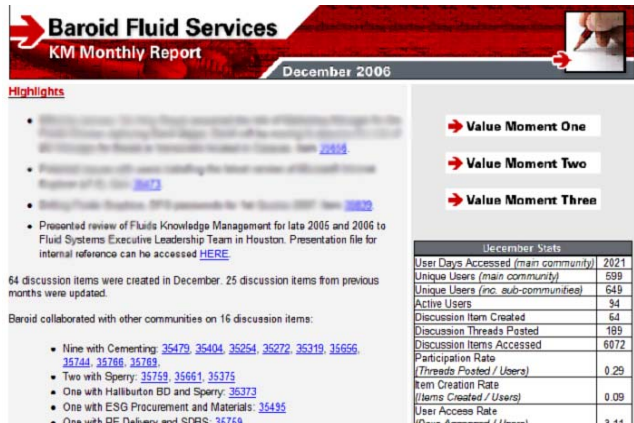


Image 4: Sample KM Monthly Report

## Innovation Challenges

Of course some serious challenges remain to be addressed as we continue to evolve our innovation efforts. We hope to publish future papers as we continue to consider, investigate and test solutions to challenges such as:

- Balancing intellectual property protection with broader participation.
- Incentives for submissions and/or participation on project teams (consider process, ‘hurdles’, types of incentives, etc.).
- Further improvement of assessment processes including use of innovation games.<sup>12,13</sup>
- Ability for employees to see and comment on previous submissions.
- Improved coordination between communities and stakeholders for those submissions that cross internal organizational boundaries.
- Extending this collaborative innovation beyond organizational boundaries (customers, suppliers, regulatory agencies).
- Realizing benefit from those submissions that don’t fit the strategy or core competencies of the company yet have potential to create value (Can they be licensed or sold? Is this a new business to create?).
- Finding ways to demonstrate this effort to attract high-potential talent.

## Conclusion

While we still have a lot work to do, we believe that an organization can and should leverage the wisdom and creativity of their crowds – be it employees, customers or other stakeholders. Many recognize the need to improve our ability to identify, assess and develop the right products, services, processes and models. Managing the flow of information while protecting intellectual property can be time-intensive. But the potential benefits (developing new products and services that meet customer needs, improving the company’s long-term competitiveness and meeting the needs of community members) outweigh the costs.

Our IDEA system is only one step in an overall innovation, development and commercialization process. We feel the wisdom and creativity and the crowd can be leveraged to impact other steps in this process.

We challenge you to look for ways to access the wisdom and creativity of your crowd to improve your ability to innovate, understand your market, identify emerging leaders<sup>14</sup> or meet other critical strategic challenges.

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