

>> White Paper

Optimizing Decision-Making Across the Product Lifecycle



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Introduction

The Mandate: Innovate Smarter

For the past several years, innovation has been the mantra for organizations. And, in today's global dynamic economy, manufacturers must operate more efficiently and innovate more aggressively than ever before. This means better networking and leveraging the people and intelligence assets inside and outside the organization in order to make optimal decisions, instant by instant, day after day.

But, for most companies, connecting engineers, scientists and researchers to one another - and to the information necessary to make informed decisions in order to accelerate productivity and advance innovation - remains a critical and unmet challenge. And, volatile, fast-moving markets, economic and regulatory change, new sources of competition, ever-demanding consumers and a flood of data make making the *right* decision harder than ever.

Optimize Decision Making

Just as companies have automated other business processes such as Salesforce Automation (SFA), Customer Relationship Management (CRM) and Enterprise Resource Planning (ERP) in order to streamline processes and drive new efficiencies, global manufacturers are looking to inform and bring automation to product development decisions in order to:

- Reduce time to market
- Deliver winning, competitively differentiated products
- Improve quality
- Lower costs

Companies that knowledge-enable product development teams - connecting them to the experts, insights, trends and know-how they need in order to bring about new and improved products - increase productivity and reduce costs, while accelerating top-line growth and garnering significant competitive advantage.

The Knowledge Challenge

Knowledge Workers Waste Up to 25 Percent of Their Time Searching for Information

Studies show that employees waste a tremendous amount of time and productivity - numerous hours each and every week - searching for the information they need in order to make day-to-day decisions. This translates to more than 30 work days or 1.5 work months a year, per person.¹ Managers are even more affected by the quest for information, spending 25 percent of their time looking for information.

The 'information challenge', like the volume of information, is growing exponentially. Each year the amount of information *created* in the enterprise, grows by more than 65 percent. The volume of information created in the digital world - from emails and instant messages to customer records, digital

60% manufacturers claim their current systems fail to support innovation.

IDC Manufacturing Insights

¹ The Digital Workplace 2012

phone calls, compound documents, photos, blog entries, Web pages, podcasts, video streams, and so on - is expected to grow 10-fold over the next five years.²

The challenge with this information overload is the inability to get the right information to workers at the right time. And, it is not just sheer information volumes that impact employee productivity -- diversity of channels, languages, information types (structured and unstructured, with up to 85 percent of all information being unstructured), and documentation types add to the frustration³, with 60 percent of workers finding too many different types of information a bigger problem than dealing with too much information.

Waste, Rework and Redundancy

What does the growing information challenge mean for global manufacturers? Significant waste, rework, and redundancy. Studies show that employees waste countless hours recreating work that has already been done - often with their own department, division or company. One such study claimed that over 70% of companies admit to investing in research that led to (or was leading to) a previously patented solution; the estimated cost of this averaged out at 30% of the total R&D spend⁴. This waste has a direct impact on companies' bottom-line, but it also presents significant delays in time to market as well as missed opportunities altogether.

To avoid unnecessary waste, companies must arm product development teams with the information they need - when they need it - in order to make optimal decisions. With the exponential growth of online content, unstructured text, and Big Data, companies that are first to enable their employees to leverage the insights and 'questions and answers' locked in internal and external data stand to gain a considerable information advantage over their competition.

Goldfire: Semantic Search + Collaboration + Optimal Concept Generation

Invention Machine's Goldfire®, the Optimal Decision Engine, uniquely addresses the knowledge challenge - informing product decisions across the product lifecycle.

Inform Decision Making with Goldfire

Goldfire integrates a powerful collaborative framework and multi-patented, multi-lingual semantic search technology, and proven innovation tools and methods to help organizations arrive at optimal decisions. With Goldfire, innovation and knowledge workers can identify and leverage resources - both people and *information* - on-demand, across languages and document types - inside and outside the organization and in the context of the problems they are trying to solve.

Using Goldfire, product development teams can connect to one another and to the intelligence they need in order to:

- Collaboratively generate innovative concepts for market-leading products
- Identify new markets and partners
- Get on-demand competitive and technology trends and analysis

² IDC: "Cutting the Clutter: Tackling Information Overload At the Source", 03/2009

³ IDC: "Cutting the Clutter: Tackling Information Overload At the Source", 03/2009

⁴ IRN Services 2007

- Identify and connect to experts inside and outside the organization
- Leverage internal corporate assets
- Connect to relevant internal and external content
- Glean insights from Big Data
- Understand consumer sentiment as expressed in social media and on the Web

With Goldfire, collaboration and productivity are improved and decision making is more informed, enabling companies to deliver superior, competitively differentiated products - in less time and at less cost.

Exclusive Goldfire Technology	Benefit
World-Class Semantic Search	<ul style="list-style-type: none"> • Extract precise, optimal solutions from unstructured big data. • Access libraries of scientific effects, deep websites, patents, & premium content. • Mine answers from Product Data Management (PDM), SharePoint®, Documentum®, enterprise systems, shared drives, websites, and social media.
Integrated Collaboration Framework	<ul style="list-style-type: none"> • Connect remote distributed teams across multiple languages to work cohesively. • Automatically identify experts both inside and outside your company to accelerate innovation activities. • Keep distributed teams up to date on the latest developments in technology, markets, and the competition with automated email alerts.
Market Analysis	<ul style="list-style-type: none"> • Understand competitors' IP trends. • Identify new markets to extend product life (repurposing). • Identify technology trends to impact product roadmap and improve market share.
Product Development	<ul style="list-style-type: none"> • Leverage social media (Facebook, Twitter, etc.) to identify product features that drive consumer demand and best the competition. • Generate optimal product configuration for environmental & economic requirements. • Implement sustainable product development workflows and processes.
Risk Management	<ul style="list-style-type: none"> • Automated root cause analysis to proactively predict product/system failure points. • Automated FMEA to rank and resolve failure modes as a preventative measure to reduce recalls and product launch delays.
Leverage Intellectual Property (IP)	<ul style="list-style-type: none"> • Identify non-infringing alternatives to get around a competitive IP barrier. • Protect and leverage your company's critical IP assets by tracking backwards and forward citation across industries.

Goldfire Delivers Productivity Gains of 8 to 10 Percent or More

Companies using Goldfire see, on average, between 8 to 10 percent productivity gain resulting from less redundancy, more informed decision-making, greater collaboration and accelerated problem solving.

In many instances, however, companies have seen productivity gains of 20 percent or more.

Boston Scientific Improves Productivity with Goldfire

Take, for example, Boston Scientific, the \$8 billion life sciences company. In the past, Boston Scientific drove innovation from business strategy to technology development to product development. In this staged approach, engineers created technology-driven products that were then shown to business units and customers at the prototype stage. The trouble with this process was that the later groups often found gaps or risks in the proposed product late in the product development process. As a result, the company had to spend more money than expected putting out fires while trying to hold to a launch schedule. Boston Scientific decided to change its innovation process to bring more knowledge and resources into the earlier stages of innovation.

Boston Scientific engineers who used Goldfire spent only 10% of their time researching intelligence, compared to 20-30 percent by non-Goldfire users.

As part of the new innovation process, Boston Scientific gave employees access and pointers to relevant information, whether that information resided in a document or in the tacit knowledge of an expert. The goal here was to reduce the amount of time engineers spend looking for knowledge, an estimated 30% of their time. To improve upon that, Boston Scientific used Goldfire to capture, share and reuse knowledge. Boston Scientific engineers used Goldfire to identify past research and then validate whether that research could be repurposed. The result: Boston Scientific engineers who used Goldfire spent only 10 percent of their time researching intelligence, compared to 20-30 percent by non-Goldfire users.

Even Smaller Goldfire Deployments Represent Real Savings

Scenario: 15 Goldfire users each with an annual total compensation cost of 100,000 USD/EUROS:

			WITH GOLDFIRE				
Hours per Week per Employee Spent Researching	Hours per Year per Employee Spent Researching	Annual cost per Employee	Estimated Time Savings (%)	Annual Time Savings per Employee (weeks)	Annual Savings per Employee	Total Annual Time Savings to Company (weeks)	Total Annual Savings to Company
9.5	446.5	23,750	10%	1.1	2,375	16.7	35,625

The 8-10 percent, or in the case of Boston Scientific, 20 to 30 percent productivity gains speaks only to time savings in research. It does not take into account the significant cost-savings due to more effective collaboration, better reuse of corporate expertise, less rework and redundancy, accelerated problem solving and more. And, the productivity efficiencies for a larger community of Goldfire users would be exponentially greater.

Goldfire's Revenue Impact: Immeasurable

Breakthrough, Winning Products to Market, Faster.

Engineers solve problems every day - sometimes in the development of a breakthrough new product or technology, sometimes in the improvement or rehabilitation of an existing product.

To confidently answer critical product development questions and deliver high-value innovation, organizations need the right tools and methods that allow them to better identify and focus on those problems they need to solve and on those ideas that represent optimal, viable solutions.

By bringing efficiency, structure and repeatability to idea generation and inventive problem solving, Goldfire helps organizations minimize the risks associated with new product development and accelerate the identification of optimal concepts and solutions.

Companies using Goldfire see a revenue impact of one half to one percent or more.

For a billion dollar organization, Goldfire's impact on top-line revenue could represent an annual impact of 5 million or greater. This also means that an investment of as little as 100 thousand could translate to a 10-50X return on investment in the first year alone.

Whether your company markets a high volume, low cost product line such as consumer products or a low volume, high cost product line such as a jet airline, delays to market entry can measurably impact revenue. For a company like Apple who sold more than 37 million iPhones in their first fiscal quarter of 2012), even a one week delay could represent more than a billion dollars in lost or deferred revenue. (37 million X \$400 per iPhone ÷ 12 weeks per quarter)

Goldfire accelerates time to market and enables companies to deliver high quality, competitively differentiated products at a lower cost by giving engineers, scientists and product designers tools and methods to:

- Conduct robust analysis of the current state of the art relative to the technology and market space under consideration.
- Validate the rationale for exploring the new technology and market space.
- Identify emerging technology trends including potential next-generation innovation waves and the key companies involved in their development.
- Understand consumer wants and needs as expressed in social media such as Facebook and Twitter
- Glean insights from Big Data and unstructured text

“Some Invention Machine customers have reduced idea-to-concept time to two hours from two months...Invention Machine is the leader in compressing the analysis time right now.”

AMR Research

“Tools like Goldfire have dramatically improved our efficiency and effectiveness. Goldfire has allowed us to make great strides in rapidly developing new technology.”

*Dr. Tom Wiegale,
VP Technology, Goodrich
Sensors & Integrated Systems*



Leverage technical solutions across industries and disciplines to stimulate ‘out-of-the-box’ thinking. With the right innovation software and disciplines, organizations can see beyond current markets and technologies to drive breakthrough new-market innovations.

Studies show that a 6-month delay in launch date can result in a 33% reduction in profits⁵. Conversely, companies that can accelerate product development to ensure first-to-market enjoy tremendous benefits.

With Goldfire, manufacturers are not only accelerating time to market but also ensuring that their products are competitively differentiated, better performing, and compliant with regulations, but also designed with the wants and needs of the customers in mind.

The go-to-market strategies of companies using Goldfire are as diverse as the products they manufacture, but they all recognized the business opportunity in finding optimal decisions. Whether the goal is improving manufacturing yield, reducing raw material costs, extending product life, identifying new markets for existing technologies, or finding that revolutionary next-generation product that sustains the company another decade, Goldfire optimizes big innovation and incremental innovation processes for optimal decisions.

Boston Scientific significantly accelerated speed-to-market using Goldfire.

Within a year [of acquiring the software], 10% to 15% of patents filed by the cardiovascular division were generated with the help of Goldfire.

Low Cost of Ownership

In addition to the significant costs savings and revenue generating capabilities of Goldfire, Goldfire also offers tremendous savings from a total cost of ownership perspective. Because Goldfire works with a customer’s existing IT infrastructure and data sources, there is no need for moving and organizing information or prepping of data (building taxonomies, meta-data, etc.). Goldfire runs across the existing environment and automatically creates knowledge bases of widely dispersed and unstructured content across more than five languages and hundreds of document types. The alternatives are very costly so there is a large cost avoidance benefit delivered by Goldfire from a data management perspective.

Conclusion

Goldfire brings intelligence to a company’s innovation ecosystem, allowing product teams across the product lifecycle to make optimal product decisions. These optimal, informed decisions result in faster time-to-market for higher quality, better performing and more competitively differentiated products - all at reduced labor and materials cost.

Contact InventionMachine.com to learn what Goldfire can do for you.

⁵ McKinsey & Company study done for the UK Department of Trade & Industry

About IHS

IHS (NYSE: IHS) is the leading source of information, insight and analytics in critical areas that shape today's business landscape. Businesses and governments in more than 165 countries around the globe rely on the comprehensive content, expert independent analysis and flexible delivery methods of IHS to make high-impact decisions and develop strategies with speed and confidence. IHS has been in business since 1959 and became a publicly traded company on the New York Stock Exchange in 2005. Headquartered in Englewood, Colorado, USA, IHS employs more than 6,000 people in more than 30 countries around the world.

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About Invention Machine

Invention Machine is the leader in semantic research technology that unlocks decisions hidden in data. The Company's patented semantic question-answering engine empowers informed decision-making helping businesses accelerate innovation, increase productivity and deliver superior products. Over the past decade, the majority of the Global 2000 have used Invention Machine's, Goldfire, the Optimal Decision Engine, to find new markets and bring about breakthrough products and solutions. Learn more at <http://www.InventionMachine.com>.