



## Litigation Analytics - A Modern Paradigm for Better Resolving Litigation Involving Technical Issues

Litigation technical investigations powered by science & analytics, which we refer to as *Litigation Analytics*, offers as a set of services that address the diverse set of needs that litigators, insurers, and corporate counsel. *Litigation Analytics* was formulated by a team with decades of experience leading scientific and licensed engineering firms with hundreds of scientists and engineers who conducted thousands of litigation-related technical investigations.

### **Litigation Analytics achieve superior client information and interaction.**

***Clients demand resolution of cases as quickly and inexpensively as possible with the best outcomes.***

*LITIGATION ANALYTICS does this by empowering decision makers to attempt an early resolution, or to proceed further based on:*

- *knowing exactly what it will take to prevail.*
- *which technical experts will really be needed.*
- *how much expensive testing will be needed to make a compelling case.*
- *informed and realistic estimates of the costs Involved.*

Authoritative and compelling insight helps the client be part of the effort so that they can understand and deal with the issues and appreciate the challenges and costs of the litigation. Legal firms are conducting significant amounts of technical investigations, but this is not their core competency. A legal firm's clients expect use of the best practices that exist for managing the conduct of technical

investigations. Industry would not conduct a technical investigation on an ad hoc basis because it is an expensive and ineffective approach to conducting technical investigations that industry has already discarded. Nonetheless, this can happen in the litigation environment because the differences in expectations and the methods used by lawyers and technical investigators and the need for independence of the investigator make it difficult for attorneys to actively manage technical investigations in the manner in which modern technical investigations are best managed.



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### Need 1: For Litigators - Improve Outcomes and Lower Costs of Individual Litigation Cases

**LITIGATION ANALYTICS is important** because technical expert investigations can account for 15% to 40% of the costs of technically oriented cases, but currently fly under the legal project management process.

Corporate America's R&D model has demonstrated the success of the approach by:

- Identifying known key issues at the outset.
- Establishing compelling insight from available research coupled with top-notch analysis to fill the gaps.
- Limiting expensive trial and error technical work, testing and duplication of knowledge that already exists.
- Avoiding expensive duplication of knowledge.

Litigators face intense pressure to meet client expectations and reduce costs.

This environment has led firms to explore alternative payment options and to employ legal project management. Equally important is to explore strategic ways that simultaneously improve outcomes and efficiency when technical investigations are central to the outcome of a case.

The outcome of a case is decided in

many ways by the quality of the expert that is used, but legal firms today face a critical challenge in that the typical narrowly focused expert model is increasingly incapable of providing comprehensive insight and meeting clients' expectations for superior legal services. The technology revolution has completely changed the way products and processes are designed and the materials and methods that are used. This makes technical litigation issues increasingly multidisciplinary, complex, and costly.

The realities of a case are not under anyone's control, but the effective discovery of those realities and the framing of their meaning and implications are the foundation of achieving a superior outcome. Litigation Analytics addresses this need through a gatekeeper expert approach using an expert who has dramatically broader experience than the typical litigation expert plus the proven ability to find and harness the relevant information that exists in the vast amount of information that is available today. This type of expert is rare but using them changes a case. The need for multiple experts is reduced and often eliminated. Key insight is provided early in the investigation which allows early settlement or focused the investigation if the case continues. Opinions are often derived by two or



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more independent analyses which makes the opinions more authoritative. Knowledge that already exists (although often outside of the organization and unknown at the time of litigation) is found and not duplicated and expensive testing is focused and minimized.

### **Need 2: Provide Litigators with Objectivity and Assist with Oversight of Technical Investigations**

This service ensures all issues are addressed and coordinated, deadlines are recognized and met, and costs are planned and tracked. Forgotten work, rushed work, work assigned to inadequate resources - all of these add avoidable costs and imperil achieving the best outcome. This also allows the testifying expert to focus on their core

*The compelling message from corporate R&D experience is that issues must be defined at the outset, work must be planned and assigned to the best resource, and results must be tracked and integrated.*

*LITIGATION ANALYTICS augments the work of expert witnesses, and attorneys retain all of their decision-making and oversight of expert witnesses.*

technical competencies by transferring to the more experienced project manager other essential functions such as integrating insight from multiple disciplines, coordinating multiple and simultaneous activities of consulting experts and test facilities, and meeting deadlines.

A *Litigation Analytics* gatekeeper can also see the strength and weaknesses of the case more objectively, and ensure that the expert's testimony is sound, supported by understandable (to laypeople) facts and testing results, and explained in terms that are understandable, credible and therefore authoritative and compelling. Narrowly focused experts may miss key technical issues that lie outside of their scope of focus. Failure to establish all of the issues and their importance at the outset creates avoidable costs and can significantly imperil achieving the best outcome. The initial facts of the case often fail to identify all of the issues, and can even be misleading, especially for complex and multidisciplinary technical cases. Someone with superior analytical skills, broader experience, and proven skill in finding and accessing relevant information from the numerous sources that exist



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including academia, R&D, product development, industry studies, etc. is needed.

Conducting a search of this nature is a skill that is central to industrial R&D, but not necessarily to product liability and accident investigation, and contributes heavily to achieving authoritative results that are credible and compelling.

### **Need 3: Provide IP Attorneys a Unique Way to Establish How A Set of Claims Would Actually Perform**

Patents may not be reduced to practice, which poses a challenge in intellectual property (IP) disputes. *Litigation Analytics* provides a reliable way to estimate how a device or process as claimed in a patent, whether or not reduced to practice, would work by combining relevant available data with fundamental scientific principles.

### **Need 4: Provide Corporate Counsel and Insurers a Proven Way to Manage Their Litigation Portfolio**

*Effective information searches coupled with top-notch analysis to fill the gaps identifies key facts already discovered by the existing research of others. This analysis can provide 60% - 80% of what will ultimately be discovered and offers a unique way to establish deep insight at to the common scientific and technical principles that underlie numerous seemingly unrelated litigation cases. This approach also provides a unique way for early settlement of cases. If the case continues, these findings set the basis for client involvement and for determining the outcome by guiding the investigation work and avoiding duplication of existing knowledge and expensive testing.*

The data mining and modeling approach inherent in *Litigation Analytics* offers corporate counsel and insurers a unique and powerful way to consolidate numerous seemingly different cases into far fewer silos that share common bases of key technical issues. The benefits of this are huge as Whirlpool Corporation has shown.

Defining the silos based on technical key issues means that most of the key issues are defined once and can be

researched to develop more insight as to why these failures or accidents happen.



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### **Need 5: For Corporate Counsel and Insurers - Improve Management of Multiple Litigation Cases Involving Technical Issues and Experts**

Procter and Gamble (P&G) has published extensively on their approach, which is representative of the shift in R&D management across the corporate landscape. They provides an excellent description of how the exact same issues faced by litigators have been successfully tackled by modern corporations.

Drawing on contemporary corporate R&D technical project

management methods, litigation-related technical investigations would be led by a team that includes a gatekeeper expert who functions as technical project manager and one or more technical experts who would ultimately provide the expert testimony. An essential aspect of this paradigm is that the role of the testifying expert remains exactly as it has been. inclusion of a technical project manager as a consultant to the attorney provides essential benefits for modern multidisciplinary technical investigations as has been well demonstrated by corporate R&D experience, and whose role relieves the testifying expert of functions with which they may not be experienced or effective. The gatekeeper expert/project managers has good people skills and manages the expert's environment while the expert applies their technical judgment and the work upon which they will testify.

The technical project manager is someone who is highly educated and widely experienced with science and engineering methods, project management techniques, and the rules of legal procedures regarding admissibility of expert evidence. Serving as a consultant to the attorney allows the technical project manager to function under attorney-client confidentiality to provide critically needed functions.

*The challenge is to make costs lower and more predictable while improving outcomes.*

- *Litigators face the same challenges corporate R&D management face. Technical work is too often handled reactively, with experts focusing on specific and narrow investigations; the risk is poor outcomes and budget overrun from misdirected work, and expensive duplication of what is already known.*
- *Contemporary corporate R&D project management provides a relevant template for litigation related technical project management.*
- *The paradigm shift in corporate R&D project management has reduced costs and improved outcomes, and the legal community can achieve the exact same outcomes.*



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<p><b><i>Litigation Analytics is an innovation that empowers you to understand the key technical issues in a case and pick the ideal expert. This provides your clients with:</i></b></p> <ul style="list-style-type: none"> <li>✓ <i>The quickest and best possible outcome.</i></li> <li>✓ <i>A unique opportunity to pursue early resolution (prior to expensive testing) based on knowing 60% to 80% of what might ultimately be uncovered.</i></li> <li>✓ <i>Superior technical insight for even the most complex and multidisciplinary issues.</i></li> <li>✓ <i>A reliable basis for expert testimony that uniquely meets rules for admissibility established by the Supreme Court.</i></li> <li>✓ <i>A strategic advantage with corporate clients since Litigation Analytics uses the contemporary industrial R&amp;D model that they already appreciate improves outcomes and lowers costs through use of all existing knowledge and elimination of duplication, especially unnecessary and potentially confusing testing.</i></li> </ul>	<p><b><u>(1) Define the Technical Issues</u></b> – A gatekeeper broadly grounded in physics, chemistry, design, and business operations gathers insightful information prior related cases, trade association publications, patents, manufacturer’s marketing materials and reports, and Internet blogs and forums to establish the key technical issues that will determine the outcome of the case.</p> <p><b><u>(2) Establish What is Known About the Technical Issues</u></b> - Contemporary analytics is used to apply the information from step 1 to the situation under investigation. Data mining uncovers key trends and relationships, and data modeling fills in missing data. Industry publishes product data and universities conduct applied research, so relevant data likely exists that can provide up to 60% to 80% of the insight as to what happened in an accident or product failure.</p>	<p><i>The first two steps of the Litigation Analytics Process do not require an inspection and can be sufficient to provide a way to settle a case early because these two steps can provide a reliable identification of the cause and origin of accidents and product failures. These two steps also provide a reliable basis to assess the strength of one’s position in a case and to make good decisions about how to proceed.</i></p> <p><b><u>(3) Reliably Define Inspection and Testing Needs</u></b> – If the case is not settled early, this analytics-based process ensures that existing knowledge will not be recreated, and that reliable inspection and test plans are established, which cuts costs, ensures that testing does not produce a confusing outcome, and ensures that the investigation covers all key issues.</p> <p><b><u>(4) Coordinate, Oversee, and Effectively Communicate</u></b> - <i>Litigation Analytics</i> ensures that the overarching technical concepts are effectively framed and communicated, and eases report preparation. The investigation’s outcome and its presentation are clear and compelling.</p>
	<p><b><i>Litigation Analytics uses information research coupled with top-notch data mining and data modeling based on sound scientific principles early in cases to establish the key MAKE OR BREAK technical issues and everything known about them. Our Litigation Analytics process brings litigators the techniques that have revolutionized industrial R&amp;D, providing the better outcomes and lower costs that industry has achieved in overcoming similar technical investigation challenges.</i></b></p>	



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- ✓ *Realistic estimates of costs for expert technical investigations.*



## **Litigation Analytics - A Modern Paradigm for Better Resolving Litigation Involving Technical Issues Case Studies**

The following case studies demonstrate the project management methods that have been described and the benefits they achieve. Many others could be provided, but these two cover many of the key issues and demonstrate the benefits of the proposed approach.

### Aircraft Repair Procedure

We were involved in an aircraft crash involving fatalities that was alleged to have occurred because of a repair procedure that was claimed to be faulty and degraded an advanced material, leading to the failure of a critical component of craft. This repair procedure had been used for a period of time on many aircraft, and was alleged to have been responsible for more than one fatal accident. A technical investigation of this type involves numerous issues that have to be identified at the outset and understood in the context of their interdependencies. It is partly a materials issue, partly a mechanical engineering issue, partly a design issue, partly a physical chemistry (thermodynamics) issue, and partly a certification and standards issue, but not solely or even predominately any one of these issues. This type of case strains the resources of any one expert, but having an expert in each technical area is not attractive and would not address integrating each aspect of the investigation into a single message that a judge or jury of non-technical people could easily follow.

This situation was successfully addressed by the technical project management approach described in this paper. The other side had hired a chemist and a professor of mechanical engineering as experts. Their work was not only uncoordinated, but it was conducted as two distinct silos that did not address all of the issues involved in these cases.

Using a corporate R&D project management approach, we conducted a thorough review of the incident and relevant information that was accessible in the literature as part of a multidisciplinary analysis of what could have happened. This revealed that complex issues such as Finite Element Analysis (FEA) of stresses and failure modes of an advanced material would have to be addressed if the conventional approach to defending this type of claim





Litigation Analytics - **A Modern Paradigm for Better Resolving Litigation Involving Technical Issues** was taken, but the information that was gathered also allowed the team to establish what could have happened and what could not have happened, and this knowledge provided the key to establishing easier to understand, authoritative, and compelling expert witness testimony for our client and to identifying critical flaws in the analysis and testing conducted by experts for the other side.

An expert for the other side conducted a test that showed a high temperature increase if a torch was placed on one side of thin foil and the temperature was measured on the backside. They purported this test to demonstrate that the repair caused excessively high temperatures that degraded the advanced material. Our analysis of what could have happened had identified that heating during the repair could not have raised the temperature of the advanced material to the point at which it would degrade because the thermal mass of the component was so large that the torch could not provide heat quickly enough. Knowing what to expect, the repair was performed with a part that was instrumented with temperature sensors, and this clearly showed that the repair did not cause a sufficient temperature increase to degrade the material in a way that was credible, authoritative, compelling, and easily understood by people not familiar with aircraft and who lacked a technical background.

Another expert for the other side, a mechanical engineering professor of some stature, produced a 36-page presentation of finite element analysis results to backup their theory of how the component failed due to failure of the advanced material. Again, our analysis of what could have happened had established that the advanced material was not a failure critical component, and this provided the insight we needed to find the flaws in the boundary conditions that were used in the finite element analysis. We were able to show that the boundary conditions had no relationship to reality, so that the finite element analysis and 36 pages of equations were irrelevant.

Our approach required the key issues in several different disciplines to be identified and a number of tasks and people to be effectively coordinated to conduct the needed tests and simulations. Our LITIGATION ANALYTICS approach avoided a complex and possibly



Litigation Analytics - **A Modern Paradigm for Better Resolving Litigation Involving Technical Issues** unsuccessful defense that without the LITIGATION ANALYTICS insight would have had to be based on highly mathematical issues of stress analysis, if use of heat during the repair was appropriate, and how aircraft performance might be related to failure of this advanced material. A favorable settlement resulted, costs were reduced, and the best outcome was achieved in a case where this seemed uncertain.

### Chemical Process Equipment Failure

Heating equipment used in a chemical process failed due to corrosion. Prior to our involvement, the investigation of this project was initially handled in the conventional single expert approach. Metallurgists were hired by each of the involved parties, and they all agreed on the existence of corrosion, the nature of the corrosion, and the manner of failure of the heater. Nonetheless, there was disagreement on the complex issue of the responsibility of the parties in selecting the material that corroded, and on who actually was responsible for design of the system. One attorney approached us rather late in the case about this design responsibility issue.

This case is an excellent example of the problem with the historic approach to expert investigations of not identifying all of the potential issues at the outset and analyzing their potential contribution to the incident. Instead, this was seen as the obvious metallurgical issue of corrosion so metallurgical experts were obtained for that purpose, and by default, this made the problem an investigation of metallurgy, but the real problem was something very different.

Upon our involvement, we adopted the multidisciplinary project management approach described in this paper, and we conducted an analysis of what could have happened. We collected the information that was known about the behavior of the metal in several other chemical processes where similar conditions would exist and we concluded that the material should have performed properly and not corroded. We also collected the information that was known about the nature of conditions in the chemical process in which the equipment was used, and concluded that the type of corrosion that occurred



Litigation Analytics - A Modern Paradigm for Better Resolving Litigation Involving Technical Issues should not have happened under these conditions. Together, these insights led the attorney who hired us to pursue a strategy that had been unrecognized to this point and ask for further documents and information about the way in which this specific chemical process was operated. The other side produced materials that showed the process was operated with non-typical conditions that would cause corrosion, but conditions that could not have been anticipated by the maker of the supplied equipment. This line of inquiry also showed why another facility operated by the same operator did not experience corrosion with similar equipment. This took the supplier of the equipment from a difficult position of a defense based on not being responsible for the selection of the material to a far easier to understand issue of the equipment being used in a way that was never specified for its use. A very favorable settlement resulted in a case that was headed to trial because of our multidisciplinary analysis of what could have happened.

These case studies, and others that we could cite, demonstrate the large cost savings and improvement of outcomes that can be obtained by replacing the conventional single investigator approach to litigation-related technical investigations with a modern, multi-disciplinary approach adapted from leading corporate R&D methods.

*The Author and LITIGATION ANALYTICS Leader: John Fildes, Ph.D. is uniquely qualified through experience and training to provide insight on the role of science and engineering in litigation. He has organized and conducted over \$26 million in funded projects including research, development, litigation expert witness investigations, and collaborations involving Government labs, large companies, and leading universities. John was instrumental in establishing and served as co-Director of Northwestern University's federally funded Advanced Materials Intelligent Processing Center, which was a highly successful collaboration involving University staff and professors, McDonnell Douglas (now part of Boeing), DoD Suppliers, the Office of Naval Research, the Naval Air Warfare Center, and the Naval Sea Warfare Center. He has 48 published papers, reports and presentations, and has 3 patents. John's credits involve creation and management of an extensive and impressive list of ventures, which include:*

- *CEO of Packer Engineering, an engineering services firm of over 100 staff members and \$18 million in revenues.*
- *Start-up a science and engineering consulting firm of over 20 people that serves industry, litigators, and insurers, of a model-based product design firm, and of a 501(C)3 not-for-profit research*



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*institute that has led a multi-million dollar collaboration of Northern Illinois University, the U.S.*

*Army's TACOOM, the Army's Armament Research, Development and Engineering Center (Picatinny Arsenal), the Army's Benet Weapons Laboratory, PM Solider Weapon, and the small arms industry.*

- *Leader of a Northwestern University research group with more than 30 staff members.*