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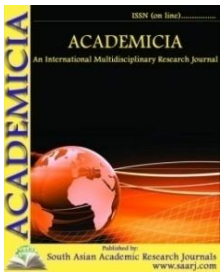

RESEARCH & DEVELOPMENT IN MANAGEMENT

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ABSTRACT

Internationalization of R&D has unleashed a considerable degree of tension within multinational corporations. This paper explores the nature of such a tension in the Japanese multinational firms. At first glance, the most obvious tension appeared to be on the autonomy and control issue between the headquarters and overseas laboratories. However, taking perception gaps as the primary manifestation of organizational tension within a firm, we learned that the tension appears to be more salient in information-sharing issues than in autonomy-control issues, and that the local side seems more dissatisfied with the current level of information sharing and granted autonomy than the parent side. Inter-industry and inter-laboratory differences regarding such findings were also examined. Qualitative data revealed that the nature of organizational tension actually evolves along the differing stages (i.e. dis-integration and re-integration) of R&D internationalization. Theoretical implications for network and information-processing perspectives were also discussed in the context of the dynamics of organizational tension.

INTRODUCTION

DEFINITION OF R&D MANAGEMENT: is the discipline of designing and leading R&D processes, managing R&D organizations, and ensuring smooth transfer of new know-how and technology to other groups or departments involved in innovation.

(or)

R&D management can be defined as where the tasks of innovation management (i.e., creating and commercializing inventions) meet the tasks of technology management (i.e., external and internal creation and retention of technological know-how). It covers activities such as basic research, fundamental research, technology development, advanced development, concept development, new product development, process development, prototyping, R&D portfolio management, technology transfer, etc., but generally is not considered to include technology licensing, innovation management, IP management, corporate venturing, incubation, etc. as those are sufficiently independent activities that can be carried out without the presence of a R&D function in a firm.

R&D MANAGEMENT MODELS

A) MANAGEMENT MODELS

Few dedicated management models for R&D exist. Among the more popularized ones are Arthur D. Little's Third generation R&D management, the Development funnel, the Stage-Gate model or Phase-Gate model product development, and Technology integration. All these models are concerned with improving R&D performance and result productivity, managing R&D as a process, and providing the R&D function with an environment in which the inherent technological and market uncertainties can be managed.

The Path to Developing Successful New Products a joint research by MIT & McKinsey & Co. points out three key practices that can play critical role in R&D Management: Talk to the customer, Nurture a project culture, Keep it focused.

B) R&D MANAGEMENT TOOLS

- Simultaneous engineering
- TRIZ
- Voice of the customer
- PACE, Stage–gate model
- Technology intelligence

R&D MANAGEMENT

The phrase research and development (also R and D or R&D) has a special commercial significance apart from its conventional coupling of scientific research and technological development. For 2006, the world's three largest spenders of R&D are the United States (US$330 billion), China (US$136 billion) and Japan (US$130 billion). [1]

In general, R&D activities are conducted by specialized units or centers belonging to companies, universities and state agencies. In the context of commerce, "research and development" normally refers to future-oriented, longer-term activities in science or technology, using similar techniques to scientific research without predetermined outcomes and with broad forecasts of commercial yield.

Statistics on organizations devoted to "R&D" may express the state of an industry, the degree of competition or the lure of progress. Some common measures include: budgets, numbers of patents or on rates of peer-reviewed publications.

Bank ratios are one of the best measures, because they are continuously maintained, public and reflect risk.

In the U.S., a typical ratio of research and development for an industrial company is about 3.5% of revenues. A high technology company such as a computer manufacturer might spend 7%. Although Allergan (a biotech company) tops the spending table 43.4% investment, anything over 15% is remarkable and usually gains a reputation for being a high technology company. Companies in this category include pharmaceutical companies such as Merck & Co. (14.1%) or Novartis (15.1%), and engineering companies like Ericsson (24.9%).[1]

Such companies are often seen as poor credit risks because their spending ratios are so unusual.

Generally such firms prosper only in markets whose customers have extreme needs, such as medicine, scientific instruments, safety-critical mechanisms (aircraft) or high technology military armaments. The extreme needs justify the high risk of failure and consequently high gross margins from 60% to 90% of revenues. That is, gross profits will be as much as 90% of the sales cost, with manufacturing costing only 10% of the product price, because so many individual projects yield no exploitable product. Most industrial companies get only 40% revenues.

On a technical level, high tech organizations explore ways to re-purpose and repackage advanced technologies as a way of amortising the high overhead. They often reuse advanced manufacturing processes, expensive safety certifications, specialized embedded software, computer-aided design software, electronic designs and mechanical subsystems.

Although more companies are using more research and development (R&D) metrics these days, the same top five metrics continue to rise to the top, according to a 2004 metrics study recently released by the Needham, Mass.-based Goldense Group, Inc. GGI). This was the fourth metrics study done by the firm since 1998.

The top metrics were:

1. “R&D spending as a percent of sales”;
2. “Total patents filed/pending/awarded”;
3. “Total R&D head count”;

4. "Number of products/ projects in active development," and

5. "First year sales of new products."

It is not surprising that these five have remained on top over the past six years since it takes many years to sort out the "chosen few" and for practices to be adopted across industry lines.

For those who are using metrics effectively, what makes the difference? What metrics work best? What does it take to make them part of doing business? How should they be managed? We asked several practitioners about this and combined their insights with some of the most salient learning revealed about metrics at the August 2004 PDMA Metrics conference. Here are the results — 10 lessons learned" — to keep in mind.

Lesson 1: Use hard and soft metrics — Just the term "metrics" conjures up the notion of quantitative measures of outcomes like cycle time or defect rate. At Boeing, a leading global aerospace company headquartered in Chicago, Ill., large complex development programs are managed with metrics that assess cost, quality, risk, and schedule reliability. But according to Chris Chadwick, Vice President of the F/A-18 program, some of the most useful metrics are soft metrics. A good example is "help needed." Chris explained that Boeing encourages team leaders to ask for help when they hit a challenge that might throw them off course. If a program has little or no "help needed" events, that's a sign of possible trouble. The very nature of these complex programs is such that help will be needed from time to time, and reaching out to tap broader expertise that is resident across the organization is a great way to resolve problems and avoid trouble. We saw a different example at ChevronTexaco, a leading global energy company headquartered in San Ramon, CA. June Gidman, Strategic Research Manager, says, "Bang for the buck measures can be the most useful but the most difficult to measure. How do you know what part of a successful well was enabled by a certain technology? It takes a certain amount of judgment to get it right."

Lesson 2: Less is more — Almost anyone who gets involved putting together a metrics program will tell you to beware of too much complexity. The many outcomes you might want to measure at the multiple levels that exist, with the variety of possible measures, all make it possible to get quickly mired in metrics. Mike Coffey is Assistant Vice President for Consumer Solutions Product Management at Sprint, a leading communications services provider based in Overland Park, Kan. Mike has put together a balanced scorecard of product metrics for managing products through their life cycle. Mike's counsel is, "Start small and measure just a few things. Then decide which additional metrics to buy." Mike's notion aptly recognizes the cost of additional metrics. The level one scorecard he uses has one or two metrics in each of four distinct categories. It took about six months to get a level one scorecard in place for each product in the portfolio. Mike also recognizes that some metrics are more important than others. "In our business, customer satisfaction and operational performance seem to drive most of the other lifecycle metrics. When customers are happy, that's a leading indicator of their intention to keep using the service." Naser Chowdhury, the Director of Global Product Management at Air Products, agrees. Air Products is a leading global provider of gases, performance materials, and chemical intermediates, headquartered in Allentown, Penn. According to Naser, "Simplicity is key." Air Products uses just a few metrics at each level, such as financial return relative to the

plan at the top level, product cost index and marketing efficiency at the second level, and more granular and tactical metrics like engineering change orders at the third level. Structuring metrics into levels is a good way to help keep them simple.

Lesson 3: Avoid the trap of unintended consequences — One of the frustrating aspects of Product Development metrics is that measuring one kind of outcome and working to improve performance against it can cause unintended problems with other outcomes. Take time to market, for example. For a company that is regularly slower to market than its major competitors, products will tend to be less fresh and often less competitive on average, putting it at a disadvantage in many industries. But focusing on time to market alone without also measuring quality, for instance, could lead to disaster. The idea is not to sacrifice speed for quality; it's to be as fast as or faster than the competition, all other things being equal. At Air Products, a similar challenge revolves around con.icts between different metrics, such as engineering efficiency and reuse. Naser Chowdhury at Air Products explains that improving reuse improves the total cost of capital — a good thing. But that lower cost of capital drives up their measure of engineering efficiency, the ratio of engineering cost to total project capital. That kind of metrics conflict needs to be avoided.

Lesson 4: Look backward and forward — Some metrics are like rear view mirrors — they tell you what has already taken place. Others act more like fog lamps, helping you see what might be a bump in the road. Both are important. Take Boeing, for example. Programs use earned value measures to get an accurate read on costs to date relative to progress. But they also use metrics, such as weight maturity, that predict whether the weight will eventually meet target constraints. "We also use trend analysis on static metrics to get a read on possible problems before they occur," says Chris Chadwick at Boeing. A good example he cited was doing trend analysis on software errors as a way to assess if they're gaining more than they're burning off.

Lesson 5: Measure internally and externally — Sometimes it's easy to measure only what's in your own four walls and overlook getting measures about the outside world. That is understandable because what you can more easily control is probably easier to measure. But what do you do if your development chain spreads across suppliers and other partners? And what do you do to see how others in your industry match up on key performance metrics? For the latter, companies rely on benchmarking. At ChevronTexaco, June Gidman indicates that the company benchmarks its capital programs, using performance benchmarks provided by an external firm specializing in capital projects benchmarks. This gives ChevronTexaco a way to assess cost, performance, and delivery, for example, relative to similar similar competitors. As for measuring outside the development chain, Boeing uses an interesting metric they call Supplier Line of Balance, which tracks whether suppliers are accomplishing their work at a rate fast enough to avoid becoming a bottleneck. They also track parts shortages and supplier health as predictive metrics that anticipate issues with the external partners they rely on.

Lesson 6: Close the loop — All too often in New Product Development, forecasts are made that are never validated. What's needed is to close the loop and measure the outcome relative to the original forecast. As simple as this sounds, it can be difficult in practice. First, there is the availability of the information, sometimes hard to come by. Second, there is the tendency to want to move on to the next thing, so no one really wants to know what happened after the fact. Being

able to close the loop on metrics can be incredibly powerful. For example, Air Products now uses make-good metrics and ties them to performance incentives. HR sets specific goals with management based on past performance and then rewards achievement of target performance. That may pay off a year or two later, in some cases. Another good example of closing the loop can be found at Sprint where product metrics are determined before products are launched, and product managers are paid part of their bonus based on the accomplishment of that plan.

Lesson 7: Make metrics matter Lesson - This may be the most important lesson learned. "This is the key leadership challenge," says June Gidman of ChevronTexaco. "Metrics fail when people can't see how they can have an impact on them. Individuals need to see how they contribute to the measured outcome." Companies can do this several ways. At Sprint, Mike Coffey explains, "Product managers themselves set lifecycle performance targets. They then work with the supply side, customer service, and marketing to determine what's needed to deliver them. This helps each product manager have a personal level of passion for his or her product." At ChevronTexaco, metrics are tied to decision-making. There are training programs and certification requirements for decision-makers, aimed at ensuring quality decisions. At all four companies, performance goals for key metrics are linked with both the annual planning process and individual incentives. Integrating metrics into the way the business is run is another way to make metrics matter for everyone.

Lesson 8: Don't let metrics go stale - Metrics are not something to simply set and forget. Success with metrics appears to require ongoing tuning. Air Products provides some good examples. "We regularly evaluate metrics to make sure they're getting at what we need as a business," says Naser Chowdhury. "We recently added a make-good metric to our incentive system. Prior to that, incentives were more focused on project execution alone." Naser also explains that metrics that measure impact can be complicated and ambiguous, making it necessary to simplify them to ensure adoption or change them to accurately capture the effect intended. Naser reports that the company also changes how it interprets metrics over time. At all four companies, it is clear that their metrics programs have been in place for several years, changing along the way, adding new metrics and taking some away.

Lesson 9: Use metrics to learn — This lesson follows directly from the previous one. If you are using metrics to learn, then you are bound to be continuously improving them. At Boeing, Chris Chadwick describes a culture of learning where metrics are essential. "If someone says, 'I can't measure it,' I know I have trouble. We encourage our people to devise new metrics all the time and to drop other metrics that are no longer useful." Boeing encourages learning through an approach called the Program Independent Assessment. It is a non-advocate review of a program, focused on helping that program overcome challenges to achieving a successful outcome. According to Chris, "The program independent assessments spread best practices and help create new metrics." Chris indicates that Boeing conducts annual assessments on how well each program is using program management best practices, including how well metrics are used. In other words, they have an explicit mechanism to gain knowledge about what they are learning from metrics in order to help them learn even more. According to Chris, "We want to ensure that there is a help needed culture across the organization — a learning, working-together atmosphere that eliminates surprises. It's when surprises are hidden that there's a problem."

Lesson 10: Make metrics readily visible — This final lesson relates to several previous ones, including learning, closing the loop, making metrics matter, and less is more. The more visible metrics are, the more they will be relevant and drive learning. One way to make metrics visible is through good communication — which requires not only clarity but also simplicity. June Gidman of ChevronTexaco indicates that good communication is an important attribute for some metrics. It helps to communicate broad enterprise performance goals, such as "Aiming for Zero Incidents," a ChevronTexaco enterprise performance goal. At Boeing, Chris Chadwick associates visibility with learning. According to Chris, "When a new measure is reported, you can set new chinning bars." Making metrics visible seems to naturally drive people to work to improve performance against the metric. A common practice reported by several of these companies is to present performance against metrics in a simple scorecard that shows status using red, yellow, and green colors where red signifies a problem, yellow indicates a potential issue, and green means performance is within goal. This kind of dashboard alerts users to potential problems, in some cases letting them access more detailed metrics to help diagnose and act on root causes.

R&D METRICS

HOW TO IMPLEMENT R&D-DRIVEN OPEN INNOVATION

SHARE

Transforming your firm in R&D innovation approach from a closed to an open one promises huge benefits. Increased agility and effectiveness, lowered risk and revenue growth through new products are some of them. In this In-Depth Article Frank Mattes shows how a firm can find the best approach to R&D-driven Open Innovation (Outside-in) based on the insights from a number of projects in this space.

Open innovation in R&D is in the top spots of the agenda for many innovation managers. It describes a concept that after its implementation improves agility, effectiveness and the risk position by opening up the innovation funnel to absorb external expertise.

R&D-driven open innovation is a powerful lever for enhancing the firm's innovativeness since it multiplies the firm's R&D resources. Two examples may highlight the point: Procter&Gamble has 9,000 people employed in its various R&D units – and estimates the global number of experts in its technology fields to be two million. And Merck Inc. estimates that although it is a global leader in its field it produces only one percent of the relevant global patents every year. Both of these firms see open innovation as an effective way for engaging the innovative potential of the thousands of brilliant minds outside the firm.

In the wake of open innovation pioneers, more and more firms from a broad range of industries have also started to open up their approach to innovation. Judging by case evidence and by numerous benchmarking studies most of the firms are pursuing one or the other open approach to innovation already – but only few have a well-architected, fully integrated and managed open innovation portfolio in place.

This article provides the necessary knowledge to do a critical assessment of the existing open approaches to innovation, to identify additional opportunities and to plan for a professional implementation. Learn from experiences and insights from 20 proven approaches from globally leading firms that are highlighted to inspire your organization to put an effective open innovation system in your R&D in place.

A SYSTEMATIC OPEN APPROACH TO INNOVATION WILL BENEFIT YOUR ORGANIZATION BY

- having more choices for solving scientific and technical problems
- realizing shorter time-to-market
- offloading R&D risk to innovation partners
- having increased chances for successful breakthrough innovations
- extending the firm's base of external innovators and suppliers

>> R&D investment decisions are made as part of a systemic, structured, and carefully defined approach used across the whole organization. By using the same approach to manage the entire R&D portfolio, the organization can see the portfolio from many perspectives. Not only can the reviewers examine how a particular project is performing against objectives and other projects, or what R&D linkages exist across the portfolio, they can also see "snapshots" of how the whole portfolio is performing in relation to important assessment criteria. This report card for the entire portfolio is extremely valuable—particularly when the process is tailored around criteria that are considered the most important investment measures for the organization. Surprisingly, many organizations (even big R&D spenders) use only a bottom-up, project-management approach. They look at each R&D project through a "soda straw" and ignore the important strategic parameters of cross-portfolio analysis and management. This discrete approach is appropriate, but only as part of a comprehensive analysis that includes a top-down systemic view.

From the outset, the organizational team must understand the underlying purpose for using a "systemic" approach for portfolio management. Then the process can be structured for the organization to realize that benefit. For example, one public-sector organization uses a systemic methodology as a change management tool. Because the organization was formed from a number of distinct labs, this process helps the team develop a common perspective and shared language to move the set of labs toward one ultimate goal: to be a preeminent national laboratory.

In the commercial sector, users often think of a systemic approach in terms of efficiency, effectiveness, new product development, and return on investment. Other organizations use the approach as a communications tool. And some use it for all these reasons.

>> The people who will use the R&D management system also design and implement it. Key stakeholders from across the company help create the assessment methodology, implement the process, and participate in investment decision-making. They also build a common language

or taxonomy to facilitate dialogue. Even in a small organization, such collaboration is difficult. But in a large organization, it can be the source of tremendous frustration. Researchers, management, and funding authorities all have different perspectives—particularly in how they look at the long-term strategy for a healthy technology pipeline versus the customer's short-term needs. Funding authorities often believe they are getting "too little return on their investments." Researchers may find themselves on short leashes—unable to do the fundamental research they believe "will strengthen competitive advantages over the long haul." And the program managers are stuck in the middle. They all need to be involved—and don't forget the customers. They have a perspective too!

>> The R&D approach balances purposes, timeframes, risks, and rewards. At one end of the spectrum, where fundamental research has a long-term horizon, risk is high. Risk is high at the other end too, as an organization transitions its new products into a commercial environment. An effective portfolio methodology lets you see the trade-off between risk and reward, as well as short-, medium-, and long-term results. The ability to capture the data graphically to portray the results across the portfolio in many dimensions is critical. This allows you to assess the contributions of each discrete project, of a set of related projects across different criteria, and of the entire portfolio by risk and reward, short- and long-term timeframes, and other dimensions.

>> Assessments are used to validate resource allocation as part of the management decision-making process. Start. Stop. Speed Up. Slow Down. Re-scope. Organizations continually make decisions about how to allocate investment dollars across the portfolio. Decisions made in one year affect the portfolio in the next year, and so on. But without a critical assessment of the entire portfolio, organizations are hard-pressed to understand the effect a complete set of decisions has on the portfolio and its return on investment (ROI). An annual assessment captures all decision-making and its impact on the portfolio constitution and its ROI over time.

You can also see how market changes, customer demands, and company policies have affected the research emphasis. Moreover, since an organization continually risks losing "institutional memory" as key staff leave or retire, a consistent approach and a common language let stakeholders view valuable information year over year, regardless of who is at the table.

Importantly, overall assessment dimensions should touch upon some reasonable combination of value/mission/strategy/impact/benefit, feasibility/risk, and cost. Other important criteria can support the assessment though typically, only a few are needed to answer the critical strategic questions. Additional concepts include technology maturity, competitive impact, innovation, and uniqueness of the activity.

>> Power is not in the criteria or data format, but in how you use the tool to drive high-quality discussions and decision-making. A systemic approach to R&D planning produces a lot of data from objective and subjective analyses of discrete projects and the portfolio as a whole. The data allow the assessors to create hundreds of "snapshots" that characterize the portfolio. But neither data nor snapshots are the complete answer. The real answer is in the combination of the questions you are trying to answer, the data required to answer these questions, and the perspectives shared around the table by those who have a stake in the outcome. Be sure to listen

to all players, regardless of function or seniority. Organizational hierarchy can get in the way of robust conversations.

>> Though responsive to continuous improvement, the approach does not change often or fundamentally so that year-over-year comparisons are difficult. It's fine to make minor changes to the methodology to accommodate an evolving organization, changing external factors, or errors in the way the original methodology was constructed. But one of the values of applying a consistent process is to see how the portfolio migrates over time. If you change the methodology dramatically from year to year, you cannot compare results. The lesson is simple: Construct the methodology. Work out all bugs in the first year. Make only minor changes in subsequent years. Some organizations find it helpful to first conduct a pilot, correct the flaws, and then roll it out.

>> The systemic approach uses illustrations and graphical results to help expedite and communicate R&D priorities throughout. Pictures are critical. People gain insights more rapidly from graphics or cross-portfolio snapshots, than from quantitative analyses or long explanations. Once the software has completed its calculations, the ability to generate a series of snapshots to illustrate the portfolio performance can help answer strategic questions and educate investment decisions. Pictures also help the research group communicate with management executives who are removed from the R&D process, but are focused on return on investment and other measures. An illustration is also a valuable communication tool in the R&D funding process.

>> Weighting factors are used to recognize the strategic significance of particular criteria relative to others. Many criteria are used to assess a portfolio. Each over-arching dimension (benefit, risk, cost) has supportive criteria. When building an approach to R&D portfolio management, start with an understanding of your organization's goals—and determine which assessment criteria to use to measure how the organization is doing against those goals. Remember, all criteria are not created equal. So use "importance" factors to weight criteria in the assessment framework. For example, "uniqueness" may be a very important criterion for a company struggling to define itself in the marketplace.

>> A mechanism is in place to allow a rapid "roll-up" of information and also to let reviewers dig deeply into the portfolio by posing key questions. A research portfolio is complex. On average, hundreds of discrete units of activity make up the portfolio and many horizontal and vertical linkages exist across those activities. So the portfolio methodology and analysis must enable the investigators to characterize the overall portfolio across its major dimensions, and create an efficient way to dig deeply into the portfolio, see the linkages, and assess how even one unit of activity is contributing to the portfolio success.

By reviewing a range of graphic displays, one after the other and in logical combinations, reviewers start to build an appreciation for the strengths and weaknesses of the whole portfolio. Patterns emerge. For example, certain work units in the portfolio may routinely appear in sub-optimal (underperforming) quadrants of the charts highlighting those units for analysis. Maybe the activity is poorly designed, under funded, or led by an inexperienced research team requiring guidance. Many times, underperformers are stars elsewhere. The ability to dig deep and roll up the analysis is critical to understanding the productive value of discrete parts and the entire portfolio—and what problem areas to address.

>> External input and participation are part of the assessment process. For fear of losing control of the decision-making process, organizations are often reluctant to involve internal or external customers in this process. That's unfortunate because organizations are biased by nature, and sometimes too close to the action to effectively gauge the quality of work under way. If you don't involve the customer or gain some kind of external perspective, bias can creep into the system and corrupt the results. Though remember that customers have a bias too: to get what they need now. So many companies use a two-step process. First, get the kinks worked out of the process and the internal organization up the learning curve to a shared perspective. Then, invite the customer to participate in the process.

Some organizations overcomplicate the process and analysis. This is not rocket science. You are putting together a common language, an integrated assessment framework, and an experiential understanding of what constitutes good R&D. You can use the analysis results to create graphic illustrations that provide a strategic perspective on the entire portfolio. Over time, this approach helps strengthen the portfolio's composition and improve its overall performance-year in, year out.

R&D MANAGEMENT: ORGANIZE TO INNOVATE

Have your R&D teams filed the application documents to take advantage of the SR&ED tax credit? If you now want to optimize and facilitate your R&D management**,** Leyton offers you tailor-made support.

R&D MANAGEMENT: A COMPLEX PROCESS TO IMPLEMENT

Managing research and innovation is an exercise which is often difficult for companies to put into practice. Indeed, it often depends on the intuition and experience of the manager, who isn't always prepared to grasp the subtleties.

THE INFORMATION GATHERING ASSIGNMENT

This consists of implementing processes within the company, making it possible to structure time sheets, standardize the terminology used in the time sheets, structure projects, carry out internal assessments and establish operating reports for management.

THE ANNUAL FOLLOW-UP ASSIGNMENT

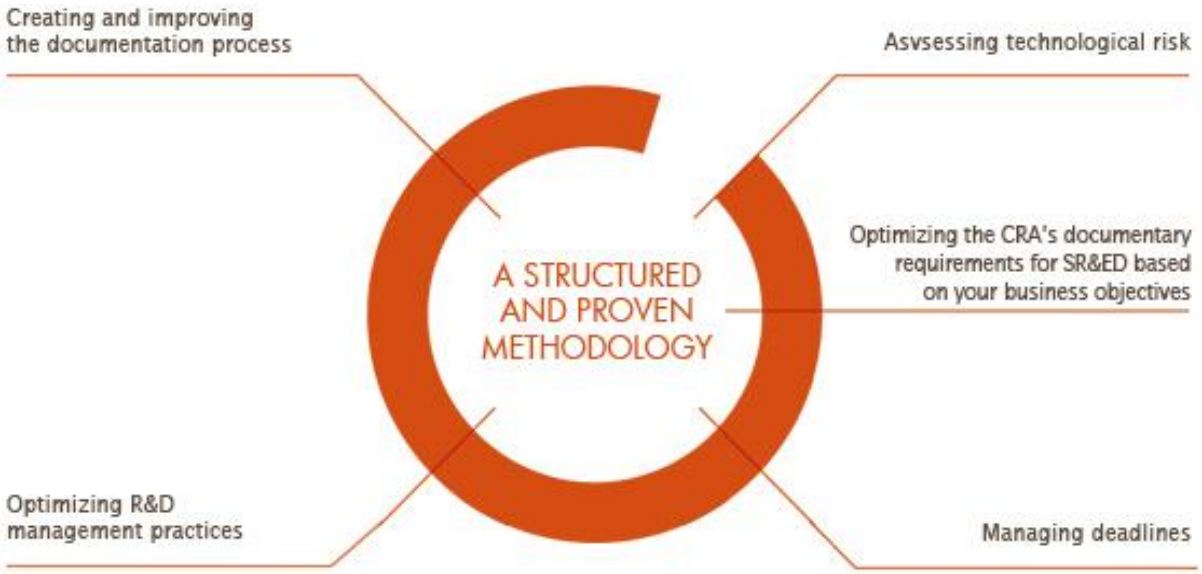
This is characterized by one or several meetings per year aimed at promoting good R&D practices among researchers. It also makes it possible to match the various types of expenditures with the related activities. Our consultants perform a time management assessment and support researchers' professional and personal needs.

THE SR&ED REPORT

This is a summary of the technical and financial information relevant to the production of a claim.

LEYTON: EXPERT MANAGEMENT FOR YOUR R&D

A company must ask the question of how R&D contributes to its objectives. It must also be aware of the delicate balance between research and future income generation. Based on years of analysis and experience, Layton has developed the necessary management techniques to assist decision makers in these critical areas.



Working with your company's management and research teams, leyton will implement high performance tools for optimal r&d management.

Leyton will provide assistance to produce your claim for the SR&ED tax credit. Our experts develop the accounting materials for your projects and fill out the required forms to make the claim at the Federal and Provincial levels. Our company also prepares your researchers and project managers for a scientific audit. We provide guidance to general management in order to optimize your tax credit and in the event of an administrative audit.

R&D PROJECT MANAGEMENT

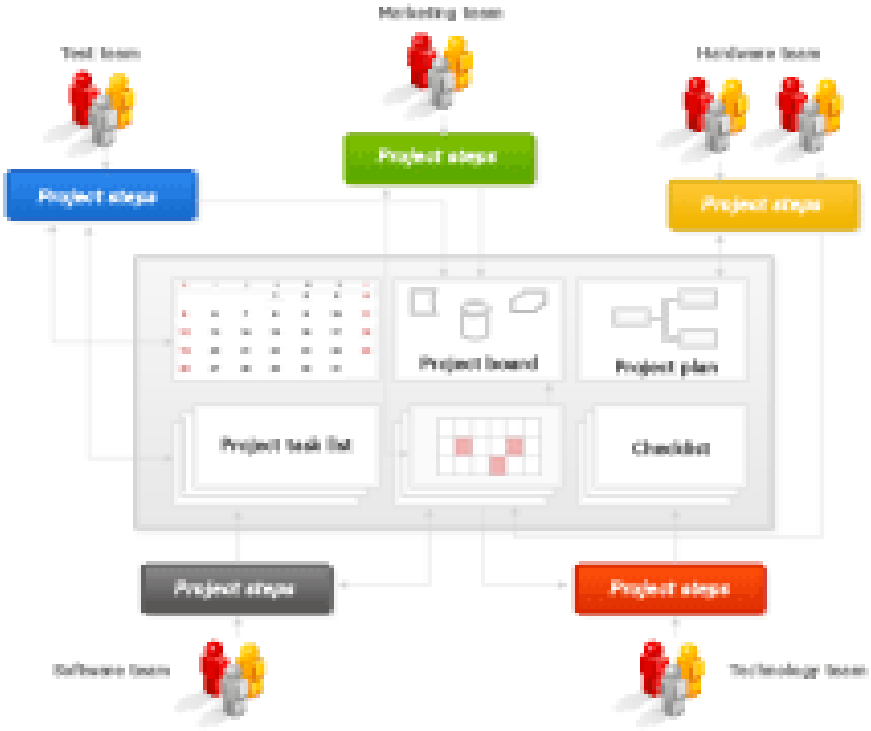
PDCA CYCLE FOR THE LAUNCH OF R&D PROJECTS AND THE FORMULATION, IMPLEMENTATION, MONITORING AND WIND-UP OF PLANS

A closed loop must be achieved for R&D project management. In accordance with the requirements of PMBOK, ensure that the whole process of project management is uninterrupted through the launch of R&D projects and the formulation, implementation, monitoring and wind-up of plans.

Through WBS decomposition, draw up the project's GANTT and PERT charts to visually show the project's plan and logical relationship and achieve visual tracking. By setting milestones in the project, monitor delivery at various stages.

REAL-TIME TRACKING OF PROJECT TASKS AND EARLY WARNING ENSURE THAT PROJECTS ARE COMPLETED ACCORDING TO PLAN

The core of project management is to form unified methods and routines through the building of structured process systems, thus emulating the success of other products. Ensure the successful delivery of projects through monitoring of the process of process management. To ensure the successful delivery of projects, we need to track and monitor the completion of project tasks in real time, ensure that project tasks are completed on time through an early warning system and at the same time enhance the sense of urgency to the whole team.



RUN THE PROJECT PLAN AS THE AXIS THROUGH DEMAND, QUALITY, RISK AND PROBLEM MANAGEMENT TO ACHIEVE A SITUATION WHERE ONCE THE KEY LINK IS GRASPED, EVERYTHING ELSE FALLS INTO PLACE

Hierarchical stratification should be implemented for R&D project plans. WBS task decomposition should be refined into blocks of 4-40 hours. After formulating the project plan, run the project plan as the axis completely through demand management, defect management, document management, assessment management, risk management, problem management, communication management, performance management, resource management and monitoring management. Achieve a situation where once the key link is grasped, everything else falls into place through the axis R&D project plan.

R&D PROJECT MANAGEMENT

R&D FINANCING

The challenge of innovation plays a key role in the growth of a modern, knowledge-based economy and aims at providing prosperity for all. Many countries have put in place R&D tax incentives, grants and subsidies to retain the best talent and world class R&D labs close to home.

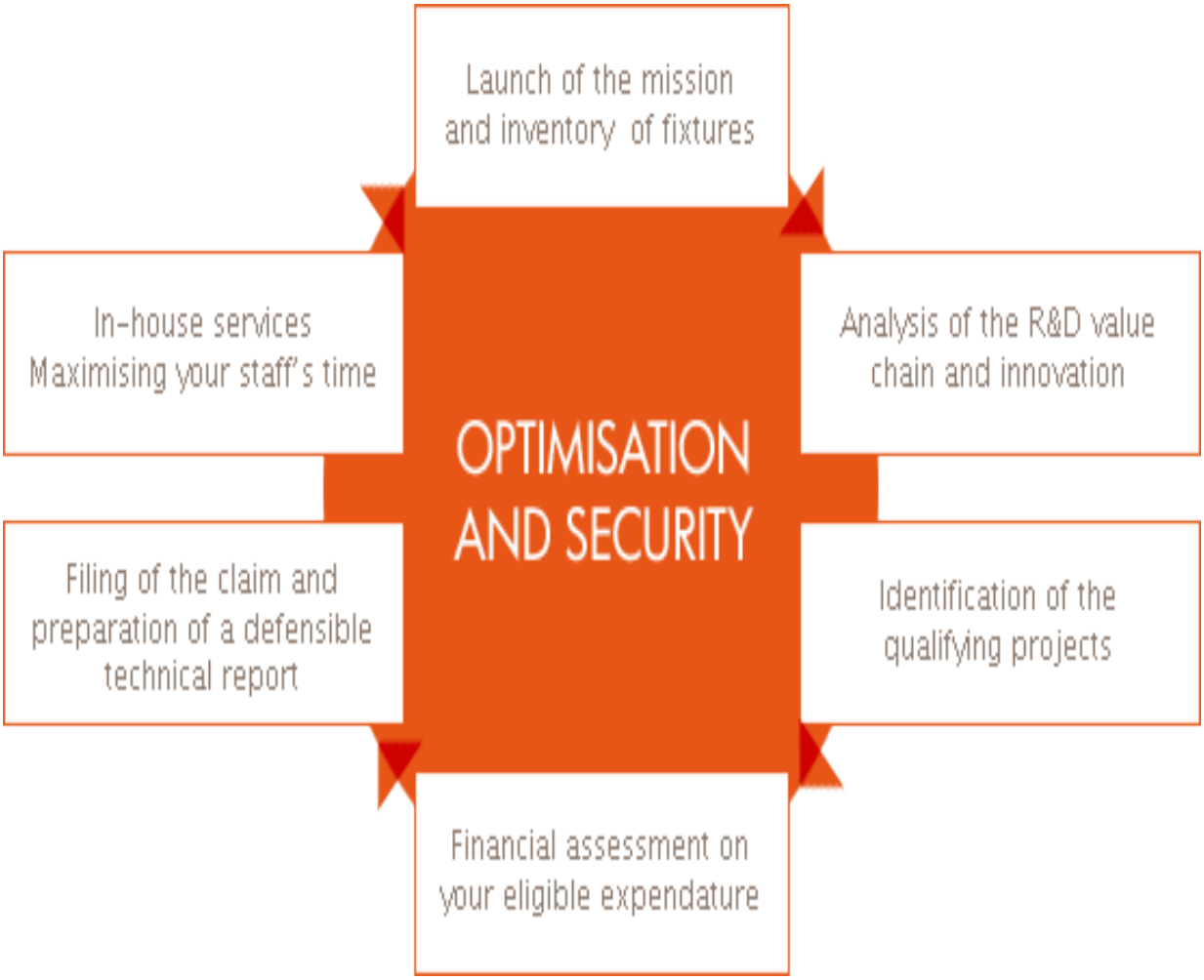
Whether it is about inventing new products, carrying out ground-breaking research or developing and improving industrial processes, the future of your business depends heavily on the quality and sustainability of investments in innovation. We help you leverage instruments that will boost your ability to stay ahead in the global competition.

SUPPORTING YOUR LONG TERM R&D EFFORTS

Leyton's multidisciplinary team of experts can make a measurable contribution to the growth of your business. Every day they mobilize the kinds of funding that can advance your R&D projects. They devise solutions appropriate to your legal structure to help you fund your projects eligible under the innovation policies of your country.

Leyton offers specialized services for every stage of the R&D process. Our extensive service begins with assessing potential for eligibility of your various projects. From that basis, we work with you in all of your R&D funding endeavors, at all times keeping one goal in mind – funding your research with the right set of tools.

>> Over 1000 customer engagement in the last 12 months



You can rely on the expertise of our scientists and tax consultants, many of them have over 15 years experience in R&D tax credits. They will give you comprehensive support in preparing your claim and defending it should it be audited by the administration.

By performing a comprehensive review of your entire R&D management process and using proprietary management tools, we will advise you on your optimal organizational structure and performance criteria.

A STRUCTURED AND EFFICIENT SERVICE

ASSESSMENT

First we determine whether your company could qualify for the R&D Tax Credit and if it is worthwhile for you to pursue an R&D claim. This is done through a preliminary meeting with one of our business consultants and your key financial personnel at no cost or obligation to you.

>> Example of eligible activities

MECHANICAL ENGINEERING	PHARMACEUTICALS	FOOD INDUSTRY
- Design, optimisation and developement of innovative products and processes	- Research on new active principles, new assays, development processes	- Design development and/or improvement of manufacturing technology and processes
- Investigation and development of ways of increasing production and improving quality	- Laboratory research	- Reduction of the risk of spoilage, waste and contamination
- Research and testing of materials, concepts, and prototypes	- Study on a known molecule resulting in a change in its activity	- Development of new packaging systems to improve safety
	- Clinical trials	- Development of new clean label products

DATA COLLECTION

Our team works with you to identify and gather relevant technical and financial information required for the claim, thus minimizing your staff's time and allowing them to remain focused on their primary functions.

TECHNICAL AND SCIENTIFIC ANALYSIS AND ASSESSMENT

Technical Audit – Our engineers meet with your key scientific and technical staff to identify and substantiate the eligible projects or activities in accordance with the requirements of the R&D tax credit legislation and guidelines.

Financial Audit – Our financial consultants assist you in identifying, extracting and presenting qualifying R&D expenditure. We assist you in relating it to the eligible R&D projects/activities and calculate the amount of the R&D Tax Credit available to you.

DRAFTING OF FINANCIAL AND TECHNICAL REPORTS

Our team prepares a comprehensive report which substantiates your claim from a scientific technical and financial point of view and acts as a robust justification of your R&D tax credit claim in the event of Administration Audit.

CLAIMING PROCESS AND FOLLOW UP

Our consultants prepare the necessary paperwork and assist you in filing the claim with your local tax office, providing backup assistance where necessary.

CONCLUSION

R & D Management publishes articles which address the interests of both practicing managers and academic researchers in R & D and innovation management. Covering the full range of topics in research, development, design and innovation, and related strategic and human resource issues - from exploratory science to commercial exploitation - articles also examine social, economic and environmental implications.