

# MEASURING INNOVATION

A framework for getting it done

# MEASURING INNOVATION

## A framework for getting it done

Pedro do Carmo Costa



### **PEDRO DO CARMO COSTA**

Exago's director and co-founder

Pedro leads Exago's business development efforts. His career has centred on the art and science of innovation for almost 15 years. He's worked to help large companies build an internal capacity for innovation, to ensure they grow and evolve successfully. Prior to co-founding Exago, he worked at Strategos with innovation thought leaders such as Gary Hamel and Peter Skarzynski. Pedro lives in London, and he's the proud father of four.

[pcc@exago.com](mailto:pcc@exago.com)



Exago is a pioneer in software and services that use collective intelligence to solve key business challenges, with an innovation-led approach. From cost reduction and customer engagement to behavioural change, we help organisations worldwide unleash people's hidden potential to achieve real results.

Since 2007, Exago has grown with our clients and partners worldwide. Together, we've reached four continents (Europe, Asia and North and South America), spanning a variety of industries – from major retailers and telecom operators to health organisations and energy suppliers.

We have three office locations: Lisbon, Portugal; London, the UK and São Paulo, Brazil.

# CONTENTS

<b>I</b>		
<b>Introduction</b>	.....	5
<b>II</b>		
<b>How innovation (and its metrics) has changed</b>	.....	6
1. THE EVOLUTION OF INDICATORS		
2. COMPANIES PUTTING INNOVATION TO WORK		
<b>III</b>		
<b>Measuring innovation</b>	.....	13
1. THE HUMAN FACTOR		
2. METRICS IN THE CORPORATE WORLD		
3. AVOID THE ANALYSIS-PARALYSIS		
<b>IV</b>		
<b>Conclusion</b>	.....	17

‘What gets measured gets done.’

*Attributed to Peter S. Drucker*



# INTRODUCTION

**Innovation has left the secluded islands and frosted glass towers of research and development (R&D) departments, reaching all corners of organisations – even going beyond innovation’s traditional frontiers. As it grows in both potential and intensity, how can we efficiently measure this complex process to gather all its benefits?**

Where to start? What to measure? How can we make the improvements needed to progress? How can we prove an innovation programme’s success, or even that it’s successful at all? With many questions and too much at stake, innovation is no longer a whim, but simply the way business is done. We need to make it work.

A clash between more traditional models – the isolated innovation islands – and new, more comprehensive models marked the last decade of the twentieth century:

// On the one side, innovation was seen, more specifically, as R&D, science and technology (S&T) and the creation of comparative advantages.

// On the other side, consultancy firms such as Strategos and its founder, management guru Gary Hamel, advocated that the concept should evolve and expand. The process became more inclusive and multifaceted, engaging larger numbers of people to address key business challenges.

We thus cannot discuss the evolution of innovation metrics without understanding the evolution of innovation in the corporate world.

This is why, in the first section, I take a brief but insightful look as far back as the 50s, to track the evolution of innovation and its main indicators. I next focus on a handful of interesting organisations’ feats – from Intel’s research labs to Uber and then Renova, with its black toilet paper – to grasp what innovation means today, the shapes it takes and a common trait all these cases share.

In the second section, I highlight the ‘human factor’ as the ‘fundamental driver of innovation’ and its implications for measuring innovation practices. I also identify the main metrics companies use to gauge the process. To conclude, I lay out a framework and simple steps we believe can help you define your own metrics set.

# HOW INNOVATION (AND ITS METRICS) HAS CHANGED

## II

### 1. THE EVOLUTION OF INDICATORS

In the 50s or the 70s, what was generally considered an innovation? How did we gauge its results? The white paper ‘Innovation Metrics: Measurement to Insight’ helps us map this evolution, highlighting the more commonly used indicators for each decade:

1 <sup>st</sup> GENERATION 1950-60s	2 <sup>nd</sup> GENERATION 1970-80s	3 <sup>rd</sup> GENERATION 1990s
- R&D expenditures	- Patents	- Innovation surveys
- S&T personnel	- Publications	- Indexing
- Capital	- Products	- Benchmarking
- Tech intensity	- Quality change	innovation capacity

The authors, Egils Milbergs, president of the Center for Accelerating Innovation, and Nicholas Vonortas, director of the Center for International Science and Technology Policy at George Washington University, explain these categories:

// ‘First generation metrics reflect a linear conception of innovation focusing on inputs such as R&D investment.’

// ‘Second generation complements input indicators by accounting for the intermediate outputs of S&T activities.’

// ‘Third generation metrics focus on a richer set of innovation indicators and indexes based on surveys and the integration of publicly available data.’

Each reflects, in this schema, the corporate spirit of its time.

Particularly during the 80s and 90s, many efforts were made to develop models to measure innovation. For statistical purposes, in 1992, the ‘Oslo Manual’ (from the OECD and Eurostat) first codified innovation as a set of tools and concepts restricted to technological product and process innovation in manufacturing.

In mid-90s, innovation had definitely been added to the corporate agenda as a specialty, gradually conquering more sectors and industries. And, by 2000, while information technology and the knowledge economy matured, a range of new metrics had become part of business management vocabulary, integrating the innovation sphere – from ‘knowledge’ and ‘learning’ to ‘intangibles’. Another word became central: ‘engagement’.

Then, a new generation of indicators was needed. Milbergs and Vonortas describe this fourth generation as 'grounded in a knowledge-based networked economy' (see the table below).

1 <sup>st</sup> GENERATION 1950-60s	2 <sup>nd</sup> GENERATION 1970-80s	3 <sup>rd</sup> GENERATION 1990s	4 <sup>th</sup> GENERATION 2000s plus emerging focus
- R&D expenditures	- Patents	- Innovation surveys	- Knowledge
- S&T personnel	- Publications	- Indexing	- Intangibles
- Capital	- Products	- Benchmarking	- Network
- Tech intensity	- Quality change	- Innovation capacity	- Demand
			- Clusters
			- Management techniques
			- Risk/ return
			- System dynamics

In the twenty-first century, *comparative* advantages have become less relevant. Countries and companies thrive by developing *competitive* advantages, which rest on 'making more productive use of inputs.' This 'requires continual innovation', Michael Porter, a Harvard Business School professor, says.

As management models have evolved into what can be called the '2.0 Age of Management', CEOs, top management, business managers and all employees must be involved in this 'continual innovation' effort. It's everyone's job.

#### THE EVOLUTION OF MANAGEMENT

	MANAGEMENT 0.0	MANAGEMENT 1.0	MANAGEMENT 2.0
<b>setting the challenges</b>	CEO	business executives	everyone
<b>idea generation</b>	top management	everyone	everyone
<b>idea building</b>	n/a	n/a	everyone
<b>idea selection</b>	CEO	Top management	everyone
<b>idea implementation</b>	top management	Top management	everyone

## 2. COMPANIES PUTTING INNOVATION TO WORK

Today, innovation is a shared process of ideation, evaluation, selection, development and implementation of new or improved products, programmes or services. The 'Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data' (3rd Edition, 2005) defines four main types of innovation:

Product | Process | Marketing | Organisational

Besides these, the concept has gained new adjectives and additional layers of meanings throughout the entire value chain. We can say it's about R&D and S&T, but it's also disruptive, incremental and social innovation, as well as innovation competencies. In practice, innovation has turned into a set of complex, collective dynamics. Let's have a look at some examples to understand what this means today.



## R&D – the technology labs

Investment in future capabilities and technology through R&D remains a crucial element in the innovation process. Markets and societies' fast rhythm of change demands it.

Intel and its research labs are a well-known case study. In 2000, the company established six first-rate labs. Following an open collaborative model, its researchers worked closely with top host universities such as Cambridge and Berkeley, sharing intellectual property rights. Together, they developed notable projects.

Yet, by 2011, Intel had closed all its labs. In a time of cutbacks across industries, high costs and low investment/return ratios may have motivated this decision, although the company declined to comment.

Intel is still the world leader in computing innovation. In October 2014, Intel's venture-capital arm announced that it would be investing \$28 million in five Chinese technology startups.

Companies that invest more in R&D, over longer periods, indeed do tend to develop the stronger competitive advantages needed, performing better than market average. They also present higher levels of productivity, particularly high-tech firms.

Nonetheless, merely investing in R&D does not necessarily make these organisations more innovative. Innovation 'goes far beyond the confines of research labs to users, suppliers and consumers everywhere – in government, business and non-profit organisations, across borders, across sectors and across institutions', according to the OECD.



## Disruptive innovation – need a ride?

Clayton Christensen coined disruptive innovation as a 'process by which a product or service takes root initially in simple applications at the bottom of a market and then relentlessly moves up market, eventually displacing established competitors'.



Could Uber, the exciting new app-based, ride-sharing technology company, be disrupting the taxi market?

Let's consider these facts:

// Uber is particularly innovative in the way it prices its services and promotes a culture of merit by ranking drivers (and customers).

// It has been the central cause of protests by taxi drivers and companies (which means that it's making significant waves in the industry).

// In some countries, it's even been banned, as in Spain and India (with specific safety and industry regulations under the spotlight).

// The service has been growing exponentially, and several other companies have imitated its model, a trend branded 'Uberification' (What are the limits of this growth? To what point can it interfere with the market's dynamics?).

Though some disagree, Uber may very well serve as an example of what disruptive innovation is. Or, it can at least feed the discussion of disruptive innovation itself: its limits, impacts and potential.

This will surely be an interesting case to follow. Still, remember that exceptional breakthrough innovations may promote one-shot market triumphs, and companies cannot rely on them alone. Companies need to balance their portfolios with various and continuous degrees of innovation.



### Incremental innovation – the ongoing evolution

iPhone at Apple, Gmail at Google: these are the results of incremental innovation – of structures, features and processes improvement – typically involving larger numbers of people in these efforts. Thomas Edison, though typically considered an inventor, was in truth amazingly brilliant at refining products so that these reached their optimal condition for use and commercialisation. Here are two more examples of incremental innovation at work.

#### a) Fleury – collective intelligence worth millions

The Brazilian company Fleury – a leader in clinical analyses in Latin America – has more than 10,000 employees. They have been included in Fleury's innovation efforts.

In 2007, the company initiated a programme to encourage suggestions for how to improve its operations, allowing all employees to submit ideas on paper. These were then evaluated by an innovation committee.

To optimise the process, in 2011, the group adopted the *Central de Ideias* or Idea Market. Created by Exago, this innovation management solution is a software platform where all stakeholders can participate – not only collecting and harnessing everyone’s ideas but also evaluating them.

Within a year, the results overtook even the most ambitious targets:

// Ideas submitted: escalating from 1,809, in 2011, to 7,269, in 2012, when the new model was implemented (an increase of more than 400%)

// Ideas approved: more than doubling, from 443 to 946

// Ideas implemented: increasing from 225 to 300

// Participation: growing from 712 to 3,309 people (15 months after implementing the platform, more than 70% of Fleury’s staff had actively joined in)

Fleury’s innovations have generated millions of dollars in value. They have reduced operating costs and introduced more efficient, sustainable and environmentally friendly processes.

In early 2015, almost 8,000 participants were still interconnected and actively participating. More than 11,800 ideas had been submitted and over 500 implemented.

#### **b) Renova – black toilet paper, really?**

‘Why not?’ was the slogan the paper consumption goods Renova used in 2005 when launching this new product. Something as unpretentious as changing toilet paper’s colour to black transformed this small Portuguese company.

Soon, newspapers and magazines across the globe rated Renova’s black toilet tissue as a top luxury good. *The New York Times* described it as a ‘must-have’, and its enthusiasts grew in number – including famous artists and personalities.

Renova next adopted different colours. Beyoncé, reportedly, is said to be a fan of the red toilet paper.

In just two years, Renova’s tissues and toilet paper could be found in 50 international markets and in the best hotels and restaurants in Japan, France, the UK, the United States, Belgium and Spain. Since then, the company has continued to multiply its trade channels, also opening pop-up stores and new concept boutiques.

Clearly, incremental innovation promotes not only trust and collaboration but also calculated risk-taking.



## Social innovation – a world of challenges and opportunities

Social innovation is an area full of endless challenges and opportunities. The concept is relatively recent, but, throughout history, examples of social innovation abound, from hospices through to the cooperative movement.

One more recent and celebrated example is that of microcredit. Through small loans and low interest rates for poverty-hampered individuals, this revolutionary social innovation model helps turn talent and ideas into businesses. Muhammad Yunus, the ‘father of microcredit’, and the Grameen Bank he founded in 1983, were jointly awarded the 2006 Nobel Peace Prize ‘for their efforts through microcredit to create economic and social development from below’.

For this paper’s purposes, I use the definition of the *Open Book of Social Innovation* (Murray, Caulier-Grice and Mulgan, March 2010). Social innovations are ‘new ideas (products, services and models) that simultaneously meet social needs (more effectively than alternatives) and create new social relationships or collaborations’.



## Whirlpool – building innovation competencies

In the late 90s, faced with stagnation in revenues and market share, Whirlpool decided to make a bold long-term investment: fostering a new corporate innovation mindset. With the help of Strategos, the company launched a global initiative to instil innovation as a core competency.

Thousands of employees were trained (as I-mentors and I-consultants). Whirlpool redesigned business processes and put together a new system of innovation management, changing the company’s culture.

Since then, the firm’s employees around the world have been contributing to innovation efforts. They participate, share their ideas for products and services and get involved in the process. In 2013, Whirlpool reported \$19 billion of sales. It’s also the world’s leading global manufacturer of home appliances.

From Intel and Fleury to Whirlpool, each of these organisations has put innovation to work to address very diverse challenges:

- // Developing new business models
- // Increasing the number of their patents
- // Improving operational efficiency
- // Improving customers’ experience

- // Developing a culture of innovation
- // Engaging their companies' talent
- // Building new capabilities
- // Creating a new marketing strategy
- // Having a true social impact

Without *results*, every one of these efforts would be useless and irrelevant. We need results, but we also need to assess them, taking into consideration the resources invested and the processes' efficiency.

**To measure outcomes, we will most likely have to adopt different metrics or different combinations of metrics, according to the goals we want to achieve.** In the next chapter, I identify and discuss some of the most relevant metrics we can use to do this.

# MEASURING INNOVATION

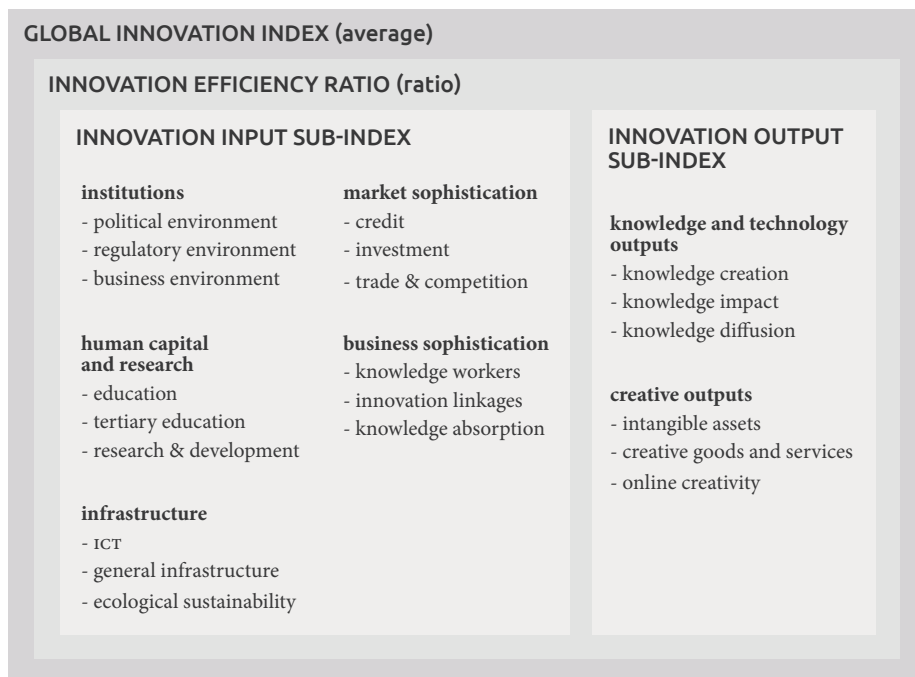
## 1. THE HUMAN FACTOR

Innovation is not a stationary object. It's a process that transforms ideas into value – a way of doing things that every company has to adopt at its core.

Since 2000, the focus on innovation has been moving to the value within organisations' people: not only employees but also stakeholders and consumers. The emphasis is on finding new means and methods to motivate and engage these people in the search for new paths and answers to vital business challenges. In other words, innovation seeks to find how to unleash their talent and expertise – their full potential to innovate.

The *Global Innovation Index* (GII), an annual reference publication that gauges countries' innovation results and capabilities, devoted its 2014 edition to the topic 'The Human Factor in Innovation', describing the human factor as 'the fundamental driver' and 'the heart of innovation'.

Developed by Cornell University, INSEAD and the World Intellectual Property Organisation, GII surveys 143 economies around the world. In 2014, it used 81 indicators to establish countries' ranking, based on the following framework.



Switzerland, the United Kingdom and Sweden topped the 2014 rank. This index considers, among other indicators, new product creation, the quality of infrastructure (e.g. access to information and communications technology), and employees' competence acquisition.

# III

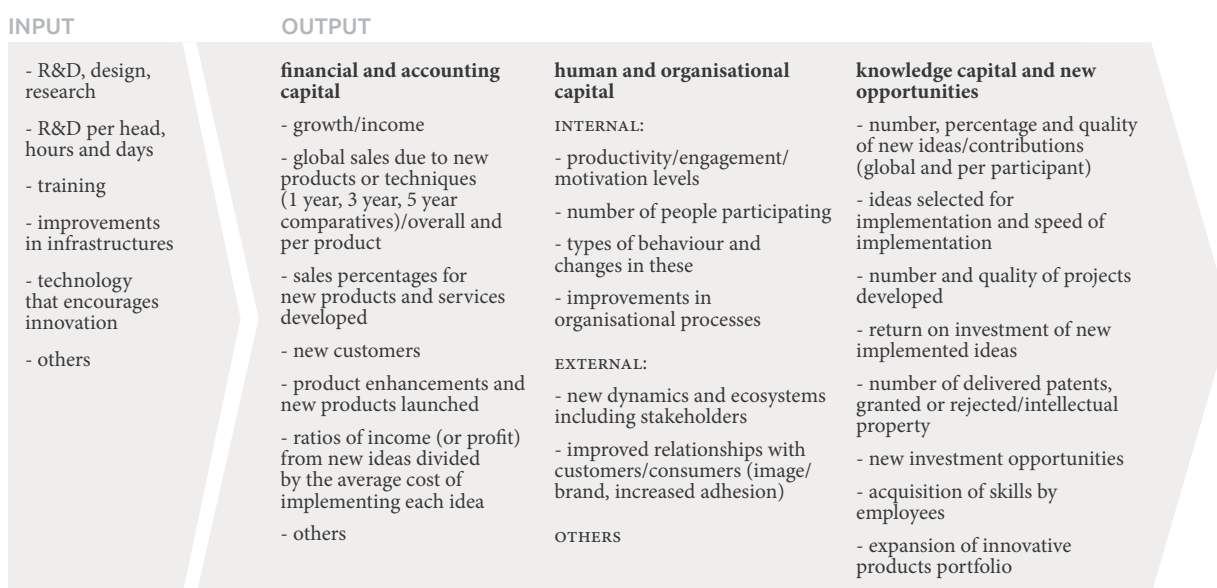
## 2. METRICS IN THE CORPORATE WORLD

What about companies? What metrics are they using? According to *McKinsey Quarterly: The Online Journal of McKinsey & Co* (2009), the main indicators ranked by importance by the 722 organisations surveyed are:

- // Revenue growth due to new products or services 16%
- // Customers' satisfaction with products or services 13%
- // Quantity of ideas or concepts in the pipeline 10%
- // Expenditure on R&D as a percentage of sales 8%
- // Sales share of new products/services in a given period 8%
- // Number of new products or services launched 8%
- // Return on investment in new products or services 4%
- // Number of R&D projects 6%
- // Number of people dedicated to innovation 4%
- // Increase in profits due to new products/services 4%
- // Potential of the complete portfolio of new products/services to meet growth targets 3%
- // Changes in market share resulting from new products/services 3%
- // Net present value of the complete portfolio of new products/services 2%

These choices reflect the 'people factor' in innovation, namely, customers' satisfaction with products and services and the number of people dedicated to innovation.

Nevertheless, bearing in mind companies' specific goals, many others can be suitable. Examples are the effort expended on cultivating an innovation culture or capabilities development and the investments made or the wide-ranging outcomes of innovation processes.



Which of these should we choose? Do they fit the needs of our specific innovation programmes? These questions become even trickier if we know that the output of one phase becomes another phase's input. Cause and effect overlap.

Reviewing the literature on innovation management, Henry Edison and his colleagues, in their paper ‘Towards Innovation Measurement in the Software Industry’ (2013), reported **232 metrics** in use by business managers and leadership, across industries.

### 3. AVOID THE ANALYSIS-PARALYSIS – A BUILDING BLOCKS MODEL

You may easily find yourself overwhelmed. But, you cannot get mired in endless reports, comparative numbers and hundreds of percentages that may have nothing relevant to show you.

Based on experiences with our clients from across several countries and industries, we, at Exago, have come to identify the chief indicators you should contemplate at each phase of the process: from the **investment** phase through to **performance and development** and, finally, **output and evaluation**.

These indicators consider three dimensions we believe are fundamental: **human capital and organisational culture**, the ‘people factor’ as the cornerstone of any innovation programme; **financial and accounting plans**, a stronger focus on growth and sustainability; **resources** acquisition and development, namely, tangible and intangible aspects, such as assets and knowledge.

EXAGO’S FRAMEWORK FOR INNOVATION MEASUREMENT  
(dimensions per stage - main indicators)

	INVESTMENT inputs	PROCESS performance & development	RESULTS output & evaluation
<b>human capital &amp; organisational culture</b>	<ul style="list-style-type: none"> <li>- people’s availability</li> <li>- leadership and management involvement</li> <li>- training</li> </ul>	<ul style="list-style-type: none"> <li>- number of participants (internal and external)</li> <li>- number of ideas and insights per participant</li> <li>- number of participants involved in idea development and implementation</li> <li>- percentage of employees trained in the innovation process</li> </ul>	<ul style="list-style-type: none"> <li>- engagement and motivation levels</li> <li>- new competencies and mindset (innovation capability)</li> <li>- strategy alignment</li> <li>- consumer/client satisfaction</li> <li>- stakeholder relationships</li> </ul>
<b>financial &amp; accounting capital</b>	<ul style="list-style-type: none"> <li>- budget allocated</li> </ul>	<ul style="list-style-type: none"> <li>- specific amounts spent in each phase of the process: from ideation through to implementation</li> </ul>	<ul style="list-style-type: none"> <li>- return on investment for innovation projects (products and service improvement)</li> <li>- cost reduction/increased efficiency and savings</li> <li>- net present value of new product portfolio</li> </ul>
<b>resources (assets &amp; knowledge)</b>	<ul style="list-style-type: none"> <li>- time spent</li> <li>- talent</li> <li>- technologies and structures adopted</li> </ul>	<ul style="list-style-type: none"> <li>- number of ideas generated</li> <li>- quality of ideas and contributions</li> <li>- number of ideas selected for implementation and actually being implemented</li> <li>- average time of implementation</li> </ul>	<ul style="list-style-type: none"> <li>- number of projects implemented (products, processes and services)</li> <li>- value of the innovation portfolio</li> <li>- number of patents filed</li> <li>- brand value</li> </ul>

Keep in mind this framework is elastic. It's a chart to identify your own metrics set, according to your specific challenges.

These three steps will help you decide which to adopt:

- a) The most important step – define how innovation will serve the strategy and purpose of your organisation
- b) Establish the nature of the results and stabilise a set of priority metrics (and practices) of input, process and output
- c) Make the process evolve by including new metrics and excluding aspects difficult to measure or those that do not suggest process improvements

Most of all, remember you don't have to start from scratch and you can't freeze up in any phase. Innovation is a process of trial and error, by its very nature. So, build a solid initial plan, including top metrics to track, and be ready to learn and adapt as you progress.



# CONCLUSION

More than 70% of corporate leaders consider innovation a top-three business priority, according to 'Innovation and Commercialisation, 2010: McKinsey Global Survey Results'. However, only 22% set innovation performance metrics. How can we explain this incongruence?

To start with, if no magic formula exists for innovation, how could one exist for measuring it? There is no single universal indicator either. And, what works in one company may get confusing or even be counterproductive in another.

Yet, innovation is the way we do business today. From R&D to disruptive and incremental methods, companies have to find a way to measure the innovation process at hand and analyse its relevance.

At the end of the day, it comes down to accountability to leadership and shareholders, as well as your own teams. It comes down to your organisation's survival.

Innovation without results becomes useless. Therefore, as you develop your innovation efforts, remember to adopt a set of priority metrics that allows you to monitor the process from its beginning and track major results. You need to understand what is worth following, what could be improved and what simply doesn't work.

Finally, do not overlook vital outcomes such as higher levels of participation and engagement – your people's collective intelligence is your most valuable asset. Take a look at our basic steps and innovation measurement framework when deciding which metrics to choose. You can learn, as you progress, how to readapt your strategy and, most importantly, how to get innovation done.

# IV

**exago.com**

**LISBOA**

RUA LUCIANO CORDEIRO, 123 – 5.º ESQ.  
1050-139 LISBON, PORTUGAL  
+351 210 997 443

**LONDON**

26 CADOGAN SQUARE 3RD FLOOR  
LONDON SW1X 0JP, UNITED KINGDOM  
+44 20 371 4 0723

**SÃO PAULO**

R. CINCINATO BRAGA, 43 4  
01333-010 – SÃO PAULO – SP, BRASIL  
+55 (11) 3340-3333

**exago.com** | [sales@exago.com](mailto:sales@exago.com)