

tessellanews

Successful change management in R&D

Successful change in R&D starts and ends with people and their goals.

By Andrew Chadwick

Change impacts people

Many of our clients, addressing technical or informatics problems, realise that the root causes of difficulties lie with people, process, organisation or culture. Whenever a substantial change is being made to systems or processes, ignoring the people issues is a recipe for failure. Any change that makes a worthwhile impact on the 'bottom line' will need people to work and think differently. Neither the business process re-engineering cookbook, nor the Six Sigma continuous improvement movement, fully caters for some specific challenges of change within R&D groups.

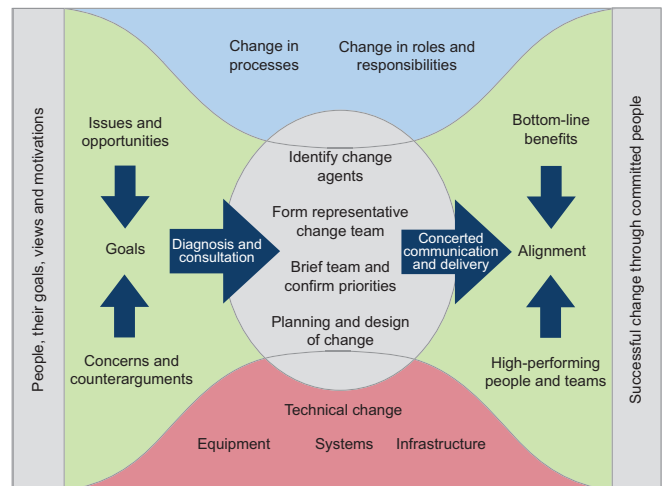
Any change really worth making will make a difference to many people in the company. If the mission changes, this may leave some fighting a rearguard action. Cost savings have to come from somewhere – they threaten both budget-holders and employees' security. Leading change requires vision, commitment, empathy, determination and follow-through.

Why is change in R&D particularly hard?

R&D has lengthy timescales, diversity and complexity of process, and specialised skills. Cost is an important measure but not the only one.

The variety of needs across different research and development projects leads to challenges in organisation, standards, process definition, performance measurement and effective learning:

- Autonomy for each project gives speed but loses economies of scale and complicates governance of service functions. A fully cross-charged model risks loss of competencies needed for long-term effectiveness.
- One-size-fits-all processes are not practicable; there will be a need for much more agile ways of working. This can frustrate continuous improvement efforts and requires deeper thinking about how good performance is defined at the operational level.
- Learning about risk and about method effectiveness can be hard to share.
- Metrics for product attractiveness and R&D performance can be compared across areas only at a very high level. Reliable and agreed leading indicators for improvement may therefore be lacking.



The focus of change must start and end with people and their goals

Start with the reason why

Surprisingly often, changes in R&D organisations, processes and systems are made without a business goal that is defined clearly enough to measure the actual improvement achieved.

In our consulting work, to help plan and deliver significant changes to ways of working and supporting technology, the first question we ask, and will keep asking, is: why do you want to do this? What are the reasons for change?

Establish a clear framework for change

In our work with management teams of leading organisations, we see many different arguments for change. However, we find one thing in common: people seldom start with a shared vision that can be articulated clearly and followed through as principles to guide implementation decisions. What seems to be a clear vision of the future can turn out to be a mirage, as you reach the delivery horizon. As a first step, tease out the vision and change goals of individuals and weave them into a clearly articulated message of the reasons and goals for concerted, coherent change.

To learn more about how Tessella can help you successfully implement change in your R&D processes, visit <http://www.tessella.com/consultancy>

AkzoNobel partner with Tessella to double capacity and increase effectiveness of HTE

When AkzoNobel needed to create a more focused custom interface to their Bosch High Throughput Experimentation (HTE) system, they called on Tessella's unique blend of scientific and IT expertise. The resulting solution has enabled AkzoNobel to double experimental capacity, make the capability available to the global community of scientists, and maximise return on their investment in the HTE system.

By Eric Arends

Business Background and Challenge

With global headquarters in Amsterdam, AkzoNobel is the world's largest producer of paints and coatings, and a major producer of specialist chemicals.

The organisation has 60,000 employees across 80 countries and produces some of the world's most famous consumer and industrial brands, including ANAC, Bermocoll, Chartek, Devoe, Dissolvine, Dulux, Elotex, Glidden, Hammerite, Lesonal, Resicoat, Sadolin, Sico, Sikkens and Trimetal.

AkzoNobel's strapline and focus is "Tomorrow's Answers Today", which puts rapid, innovative R&D at the heart of the business. One of the core functions of the company's Research, Development and Innovation Laboratory in The Netherlands is the formulation of advanced, sustainable, high value-add products. During formulation it is possible to create an almost infinite combination of basic ingredients. So, in order to increase vastly the number of combinations that can be tested, and boost time-to-market for new products, the laboratory invested in a state-of-the-art Bosch HTE robot.

The HTE robot is capable of working non-stop, automatically preparing and analysing a tray of up to 200 chemical formulations a day.

Aart Wismeijer, Senior Researcher, High Throughput Experimentation at the AkzoNobel Research, Development and Innovation Laboratory explains further, "We found that the breadth and flexibility of the HTE robot interface meant it was taking our lab technicians up to half a day to set-up and configure each experiment. We realised that the key to higher throughput was creating a more focused and customised Analyst System user interface that would enable faster experiment design, set-up and turn-around.

"We also wanted a secure and reliable way of storing the results of each experiment to allow future data mining and analysis. And finally, in order to fully leverage our investment in the HTE system, we wanted to make the design of experiments and analysis of results accessible to our community of scientists around the globe."

The Solution

Aart also recognised that AkzoNobel needed to invest in external, professional software expertise to achieve its goals. He continues, "We spoke with a number of organisations and decided to partner with Tessella because of their unique blend of scientific and IT expertise. They quickly grasped what we were trying to achieve, and really helped sharpen our requirements."

Through a series of workshops with key stakeholders, Tessella established a common understanding of the objectives and role of the Analyst System in the HTE cycle. Tessella then used an iterative development process to ensure AkzoNobel were able to fully shape the functionality and usability of the new system.

The Analyst System is an ASP.NET web application using SQL Server as the secure data store. It enables scientists to design experiments using carefully predefined building blocks, each individually proven for effectiveness on the robot. The system makes use of existing, specialist Design of Experiment (DoE) tools to perform detailed formulation of the samples.

Once the scientist has established the design, the lab technician uses the Analyst System to prepare the configuration of the experiment, which is passed to the robot using an XML interface.

Once configured, the robot automatically prepares and screens samples before publishing the results, which are made available to scientists through the Analyst System following a validation stage. The analysis of these results then provides the final modelling stage of the HTE cycle.

The Benefits

"Our investment in the Analyst System was relatively modest compared to the significant cost of the HTE robot, but it has enabled us to open up the powerful capabilities of the system to our global community of scientists. It is now much easier for scientists to design experiments and view results, but more importantly it has cut configuration time for the robot for each experiment from half a day to less than half an hour.

"This means we have been able to double the number of experiments per day, significantly increasing our overall capacity, efficiency and quality.

"It was important to the business to fully leverage this vital HTE resource. Tessella's background in science and their professional approach to system design and development has made this possible."



Image courtesy of AkzoNobel

Tessella's pioneering approach to predictive analytics boosts waste processing efficiency at Sellafield

Innovative acoustic signature monitoring of critical high-level waste processing assets aims to eliminate costly in service failure, deliver increased asset value and extend asset life by 50%

By David Dungate

Business Background and Challenge

Sellafield Ltd. is responsible for decommissioning, reprocessing, nuclear waste management and fuel manufacturing activities at the Sellafield nuclear sites.

A critical activity undertaken by Sellafield is the Waste Vitrification Process which immobilises high-level liquid waste into a passive waste form suitable for long term storage. This process is overseen by the Nuclear Decommissioning Authority, and is heavily regulated by UK government and international rules.

Central to the Waste Vitrification Process is the production of calcine from highly active liquor. This involves feeding the liquor into a rotating tube furnace that boils off the liquid leaving the solid waste as powder. Inside each tube furnace is a loose bar (known as a rabble bar) which rolls around to keep the calcine free-flowing, prevent the build-up of wall deposits and break up larger particles so they are small enough to drop through a filter at the bottom.

Dr Carl Steele, Technology Manager for the High Level Waste Plants at Sellafield, explains further, "The rabble bar is a highly stressed and vulnerable component in the process, so we were keen to find ways to maximise its operational life. Because of the isolated and hostile nature of the processing environment, any in service failure, due to a broken bar, is very costly and undesirable. It could mean a down-time of three or four weeks, which would literally equate to millions of pounds in lost production and replacement costs."

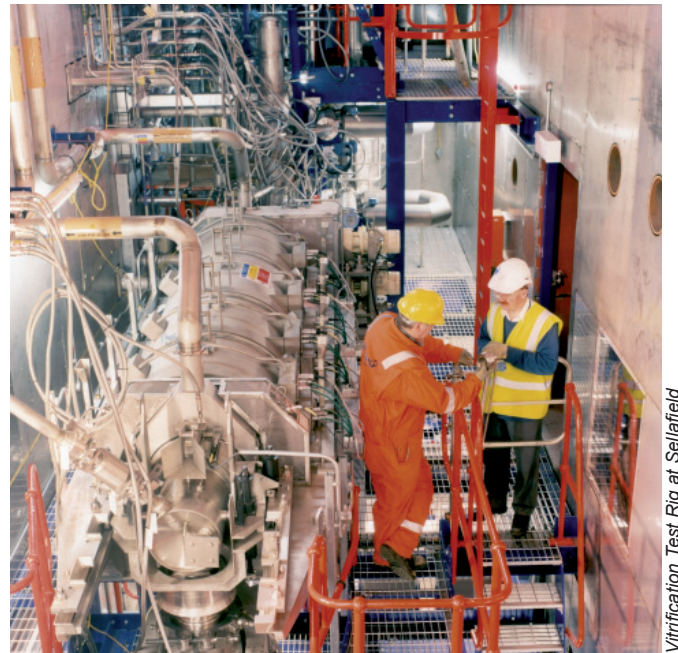
Dr. Steele continues, "Inspecting or replacing the bar early is a safer option, but, again, this requires a costly shut down of the line. So we started to look for ways to safely extend the life of the bar right up to the life of the calciner seal itself, which would avoid the need for intermediate maintenance or additional repairs as a result of an undetected failure."

Dr. Steele and his team decided that monitoring the condition of the bar in order to maximise its operating life would be the best approach. Instrumentation of the bar is difficult because of the hostile environment, so the team started by using accelerometers. Dr. Steele continues, "We were unable to efficiently analyse the volume of data produced, and so decided to invest in outside expertise. Tessella impressed us with their experience in modelling, data analysis and asset condition management, as well as their unique ability to apply scientific thinking to business challenges."

The Solution

Tessella's initial analysis of the accelerometer data prompted a simpler solution, which drew on their experience in the world of science. Why not gauge the condition of the bar from its acoustic signature by capturing audible sound using regular microphones placed outside the rotating tube?

A feasibility study was commissioned which proved that analysis of the acoustic signature was a viable route. This study involved mathematically modelling the calciner and using known acoustic properties of the alloys and the specific geometries of the



Vitrification Test Rig at Sellafield

components. Likely spectra were deduced and matched to spectra from an existing audio recording.

Using an existing full scale experimental vitrification test rig, Tessella developed a program of works to capture high-quality audio for the bar in different states – working, bent, fractured and broken. This data enabled Tessella to analyse the spectral data to predict when the bar is near to failure and so prompt preventative maintenance (if required). During the process, Tessella was also able to identify the potential failure of other moving components such as the furnace tube's bearings.

The Benefits

Dr. Steele adds, "I am extremely impressed by the professionalism and calibre of the Tessella team. They quickly grasped what we were trying to achieve, and their ability to apply lateral thinking and scientific expertise to our challenge provided a real breakthrough in the way we can now monitor and manage vulnerable assets in hostile environments.

"Using the asset monitoring system Tessella has developed, we hope to safely extend the life of the rabble bar right up to the life of the calciner seals – which would mean a 50% increase on our current expectation levels. If we can achieve this, then avoiding a very costly in service failure or even just an intermediate inspection and early replacement of the bar will more than cover the investment in the system – especially when it is operating across all three of our lines.

"Overall this pioneering approach to asset condition management may enable us to significantly boost the reliability and efficiency of the calciner process in our high-level waste processing plants. There may be opportunities to explore how this technique could be applied to other hostile operations across the Sellafield site."

Swiss Archives go live with Safety Deposit Box

Tessella is proud to announce that the Swiss Federal Archives or Schweizerisches Bundesarchiv (BAR) has accepted Tessella's Safety Deposit Box (SDB) for the long-term management of their digital information. The project was completed successfully, on time and to budget. The system is now operational and the BAR have joined the growing Tessella SDB user group.

Dr. Krystyna Ohnesorge, BAR's Head of the Innovation and Preservation Unit (UPI) says, "Tessella's SDB allows easy and efficient management of ingest, storage and preservation of our digital records. This means that we can be sure that generations to come will be able to learn from these records."

BAR began addressing the problems of Digital Archiving in 2005 with the development of the ARELDA project: the aim of which is to allow all of the Swiss federal agencies to submit records in a uniform way. After looking at various solutions, BAR selected Tessella's SDB in 2007. A requirement study and an integration plan were developed in autumn '07 to allow the system to work with the requirements of ARELDA and their workflows. The system is fully Open Archival Information System compliant and contains Tessella's world leading active preservation model.

To learn more about the work we do visit <http://www.tessella.com/sdb>

Berry Consultants and Tessella partner to produce a tool that allows clinical trial designers to evaluate, compare and optimize adaptive designs

Tessella partners with Berry Consultants, leaders in the Bayesian approach to medical statistics. Tessella and Berry Consultants will make available a jointly developed fixed and adaptive clinical



Tessella employees ready to get stuck in

trials simulator: Tessella Berry FACTS™. Tessella Berry FACTS supports key steps in the design of an adaptive trial:

- Quick assessment of the likely benefit of using an adaptive design for a trial;
- Comparison of the many design options including the choice of response model, longitudinal model and adaptation strategy;
- Refinement of trial design to optimize operating characteristics;
- Creation of a simulation report.

To learn more about the work that we do please visit <http://www.tessella.com/facts>

Sogeti and Tessella partner to provide innovative technology and organisational benefits for clients in the Netherlands

A combination of Sogeti's and Tessella's strengths will deliver cost effective solutions that will further improve organisational benefits through the use of innovation and technology.

The agreement has developed out of the parties close working relationship on a Dutch Central Government National Digital Archives Programme. This programme has been successfully delivered by utilising Tessella's world

leading archiving and preservation software solution (SDB) combined with Sogeti's programme management expertise and rigorous software testing regime.

John Masefield Cheshire Home gets a makeover

Tessella were once again out in full force for a community day and volunteered to help the John Masefield Cheshire Home in Burcot, Oxfordshire.

Tessella staff were set the task of clearing a mound of nettles and rubble, clearing away an overgrown area near a stream and painting the dining room.

Martin Waugh, consultant at Tessella and organiser of the day said: "It was fantastic to see how everyone worked so hard."

Gail Crowther, volunteer co-ordinator at John Masefield Cheshire Home, said: "We are thrilled with the work that Tessella did and are very impressed with their organisational skills – with such a professional job done in such a short time."

Tessella would like to thank Homebase in Abingdon for help in supplying paint and tools and Chilton Waste for help in supplying the skips.

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Our aim is to provide you with interesting information on topical technology issues and to outline key projects which we hope you will find of use. We depend on the feedback from our readers to help us develop tessellanews and to maximise its usefulness. Your input is appreciated; please email The Editor at info@tessella.com

Tessella – successfully delivering IT and consulting services to world leaders in R&D, science and engineering.

For decades, Tessella has been successfully delivering IT and consulting services to world leaders in R&D, science, and engineering. Through the application of scientific methods and rigorous quality procedures, we enable clients in life sciences, energy, the public sector, and consumer industries to achieve a wide range of objectives, including, forecasting floods, developing fusion power, enhancing military sensor capability, improving drug discovery and development efficiency, and reducing risk to health and the environment in the extraction and production of oil and gas. With offices in Europe and North America, global companies rely on Tessella for business critical assignments.

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