

2021-22

Quality Review



Foreword

President and CEO



Quality is about what our customers expect from ST every day.

Jean-Marc Chery
President and CEO

ST is an integrated device manufacturer mastering the entire value chain: sourcing raw materials, investing in technology and product R&D for innovation, ensuring reliable and secure manufacturing, and relentlessly pursuing quality. We aim to build strong relationships with our customers based on trust, in order to serve them effectively considering their needs. This relates both to the quality and reliability of our products and services, as well as our approach to sustainability.

Quality is a critical element allowing us to deliver our value proposition to our shareholders, customers, and all other stakeholders, and it is the collective responsibility of all ST employees. We strive to elevate ST to the highest level of quality as an asset for our customers. This report is intended to provide information on our organization, infrastructure, and the key actions and initiatives that bring our quality commitment to life.

2021 was marked by strong market demand but still impacted by the pandemic and global semiconductor supply chain

constraints. ST employees worked tirelessly to support our customers, increase our manufacturing efficiency, and to create and deliver high-quality innovative products. Our quality key performance indicators and the customer perception of our products continued to improve significantly in 2021. Today, more than ever, quality and reliability are essential for creating long-term value and fostering sustainability.

Looking ahead, we will continue our journey to improve our quality performance and nurture our culture of quality excellence, working as one ST to earn the trust of our customers.

Jean-Marc Chery

Executive Vice President for Product Quality and Reliability



Quality is about continually striving for excellence.

Nicolas Yackowlew
Executive Vice President,
Product Quality
and Reliability

From technology development to product conception and design, manufacturing and beyond, we aim to ensure our customers benefit from the highest level of quality excellence in the semiconductor industry. The improvement, over

the past year, in our quality KPIs and in customer perception are the consequence of our people's constant engagement in all quality domains.

Through our quality program, structure, and working model, all ST organizations and sites come together to work as one, unified ST and meet the needs of our global customers. Thanks to the programs and processes put in place to support this ambition throughout the year, as outlined in this quality review, we were able to improve our quality performance and consequently increase customer satisfaction and trust.

Looking ahead, several exciting challenges await us. Our quality excellence culture has prepared us well to meet them. We will continue to improve prevention in the R&D and new product domains, by innovating in design for quality, and to dedicate operational capacity to our materials and suppliers. We will also continue our quality

transformation and digitalization journey, boosting our performance in the domains of prediction, prevention, and detection with advanced solutions like data analytics, while also meeting new challenges in the areas of software quality and cybersecurity. Finally, we will further enable our people by investing in leadership and expertise.

Our quality excellence journey is a competitive advantage and a differentiation factor for our company and the products and solutions we offer our customers. It is the direct result of what we stand for collectively: Strength, Teamwork, Resilience, Innovation, Value and Expertise. These values are at the heart of each of the initiatives and efforts highlighted in this report.

Nicolas Yackowlew



2021-22 edition

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ST and quality

200 000+
customers

48 000+
ST creators
and makers

14
manufacturing
sites around
the globe



ST at a glance

As creators and makers of semiconductor technologies, we play an active part in building a more sustainable world. With the help of our partners, we provide our 200,000+ customers with products and solutions designed to address their needs and help them meet new challenges.

With over 48 000 employees from 105 nationalities, ST is one of the world's largest semiconductor companies, operating 13 manufacturing sites across the globe.

Hundreds of thousands of our solutions are integrated into the billions of electronic devices

people around the world interact with every day. Chips from ST embedding the most advanced innovations are an essential part of products as diverse as cars and key fobs, giant factory machines and data center power supplies, washing machines and hard disks, and smartphones and toothbrushes. We help our customers make these devices smarter, safer, more energy efficient and more connected. Because our products are crucial to the development of smarter mobility, efficient power and energy management, the Internet of Things, and connectivity, they allow us to make a positive difference in people's lives and help build the world of the future.

STRIVE for Excellence: quality in support of our ST fundamentals

Our quality culture and mindset, as well as our focus on our STRIVE for Excellence values (strength, teamwork, resilience, innovation, value, expertise) play a crucial part in supporting ST's company-wide fundamentals

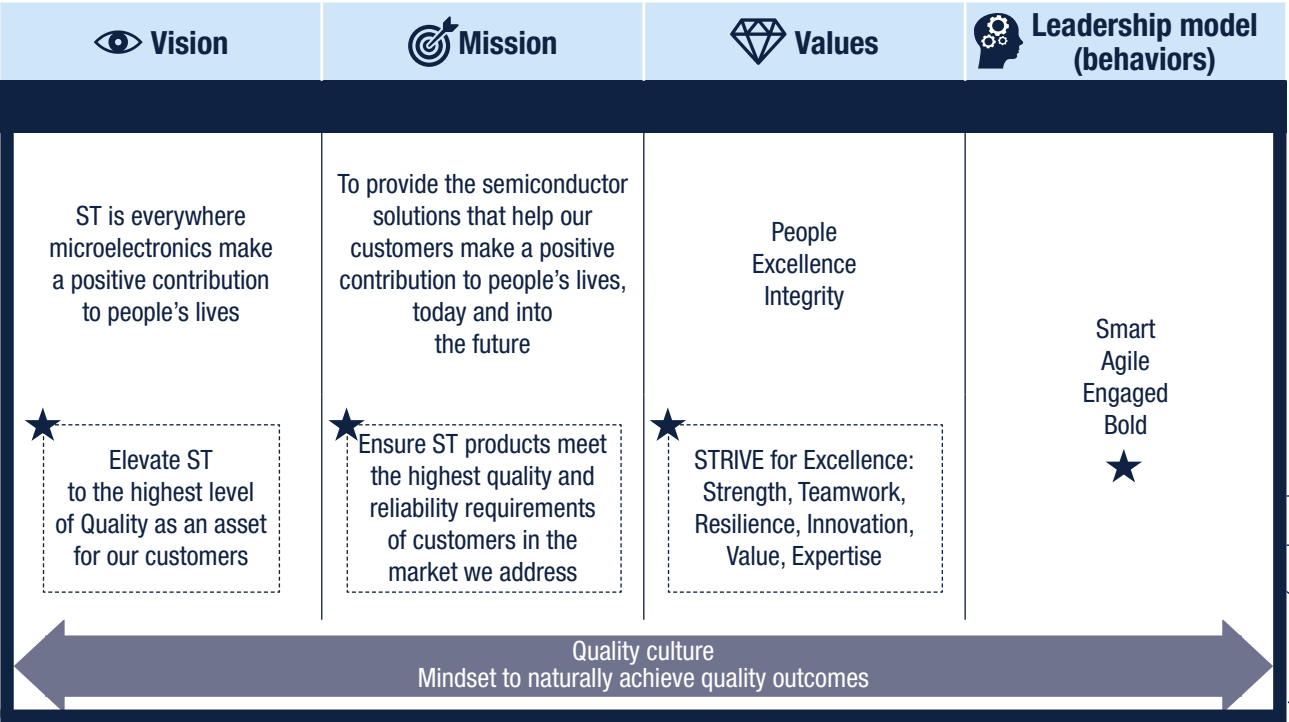
At ST, quality is a key enabler. Over the past two years, we have designed and implemented a framework to reinforce our quality values and

mindset, based on the five principles contained in our "STRIVE for Excellence" motto.

We are also developing a number of initiatives to reinforce our quality culture.

Finally, we are working to reinforce the leadership model with the associated behavior deployed at company level with a quality focus.

This focus on quality helps us meet our broader company-wide objectives, providing solutions that make a positive impact in people's lives.



ST stands for
life.augmented

Everywhere microelectronics make a positive contribution to people's lives, ST is there.

ST quality framework



Quality is about creating value for our customers and business for our company.

Nicolas Yackowlew
Executive Vice President,
Product Quality and Reliability



ST Quality policy

In ST, we are committed to making our solutions the best, safest and most reliable in the market. Our goal is to become our customers’ most valued and trusted partner through excellent quality, reliability, and responsiveness.

The foundations of our approach to quality

- ★ **Customer focus:** Every day, across every aspect of our business, striving to meet the highest quality and reliability requirements of customers in the markets we serve
- ★ **Quality strategy:** A cohesive, company-wide strategy piloted by the leadership team, setting the direction for achieving our vision, with clear, timely and measurable objectives
- ★ **Quality leadership:** A leadership team representing each organization and close to daily operations, under the direction of the Corporate Quality organization
- ★ **Quality culture:** Our willingness to continually improve, adopt a prevention mindset and embody our STRIVE for Excellence values of Strength, Teamwork, Resilience, Innovation, Value and Expertise

Our quality working model

To reach our quality targets, we have designed an efficient company-wide framework, operating at three levels:

1 - Company-wide alignment

- ★ **Quality governance:** Under the leadership of Executive Quality Management, the Quality Steering Committee defines quality priorities and supervises their implementation. A central program management office monitors the progress of the top-level quality initiatives.
- ★ **Shared quality key performance indicators (KPIs):** We use the same indicators across all ST organizations to measure and improve performance from the local to the global level.
- ★ **Customer focus:** We continually monitor customer satisfaction through management reviews and scorecards, and take targeted measures to increase customer trust and satisfaction.

2 - Structure and operation

- ★ **Quality organization based on strategy:** Our ST quality approach is fully aligned across all quality operations and business organizations. Our Corporate Product Quality and Reliability organization supports the deployment of our quality strategy by working closely with the quality departments of product groups, operations, and regions.
- ★ **ST quality program:** Our quality program breaks down our strategic plan into a set of work packages and initiatives. These initiatives are then carried out based on a roadmap that lays out accountabilities, timelines, and resources for reaching our goals and measuring our effectiveness.

3 - Foundations

- ★ **Culture, values and expertise:** Year after year, we continue to cultivate our strong company quality culture, driven by the pursuit of excellence and supported by expert networks with state-of-the-art knowledge of semiconductor products, systems, and processes.

Company-wide quality alignment		
Quality governance	Shared quality KPIs	Customer focus
Structure and operation		
Quality organization based on strategy		ST quality program
Foundations		
Culture, values and expertise		





ST QUALITY PROGRAM

Operational			
Product development	Front-end manufacturing and technology R&D	Back-end manufacturing and package R&D	Interaction of front-end and back-end manufacturing
Cross-functional			
Quality innovation	Reliability	Culture and communication	
Infrastructure			
Material and supplier management	Governance modernization	Process and tools	Product quality laboratories

ST QUALITY PROGRAM GOVERNANCE

Quality executive management	Defines targets and ambitions
Quality steering committee	Gives directions and provides support to remove roadblocks
Program management office	Monitors overall quality program progress, keeping the program's drumbeat going
Work package leaders	Drive work packages to achieve targets and support initiative leaders
Initiative leaders	Manage initiative execution

Our quality program

Our quality program capitalizes on **ST leadership and our company-wide commitment to quality**. It ensures the continuous evolution and improvement of our quality performance, by encouraging quality innovation to address new challenges and expectations.

The ST quality program covers a wide scope of initiatives in three different domains:

- ★ **Operational:** Initiatives to improve the robustness of our product and technology development flows and our manufacturing operations
- ★ **Cross-functional:** Company-wide initiatives, such as developing innovative screening methods, growing our reliability expertise, and fostering quality culture
- ★ **Infrastructure:** Initiatives that reinforce our quality framework (such as modernizing our quality management system) and build up our global infrastructure (e.g., our failure analysis capability)

A central program management office oversees our ST quality program, coordinating global, regional, and local quality performance and activities, and ensuring all ST organizations are involved in our sustainable quality transformation.

Our 2020-2022 quality program, aimed at addressing our main quality challenges, is due to end this year. It will be replaced by a new roadmap to achieve our vision for 2025, which will be defined during Envision Quality 2025, a worldwide, three-day meeting held in June 2022.

Improving quality performance

In 2021, we achieved significant improvement in our overall quality performance, as evidenced by a number of quality KPIs regarding new product qualification, compliancy, and customer satisfaction.

The evolution of these KPIs over the past years demonstrate the effectiveness of our efforts and commitment towards continuous improvement.

ST QUALITY SUSTAINABLE IMPROVEMENT TRENDS

- ★ ST Quality is tracking a number of KPIs which are cascaded to all organizations
- ★ Company quality KPIs encompass:
 - New product qualification
 - Compliancy
 - Customer satisfaction
- ★ In the past two years, these KPIs improved over twice as much as our forecast

89%
of ST employees

said “the message regarding quality’s importance at ST is easy to understand”
15 points above the GEEM norm

86%
of ST employees

said that “people in my team clearly understand how quality expectations fit into their job requirements”
13 points above the GEEM norm

Customer focus



Quality is about a mindset and a culture of targeting excellence.

Jérôme Roux
President, Sales and Marketing

Increasing customer satisfaction

We aim to become our customers' most valued and trusted partner through excellent quality, reliability, and responsiveness.

Assessing customer satisfaction

We track customer satisfaction through

- ★ Customer scorecards by sales regions and for key customers across our three core markets: automotive, personal electronics, and space
- ★ Customer surveys
- ★ Direct contact with customers to establish strong partnerships and relationships.

We define targeted actions to foster customer trust and closely monitor customer satisfaction during regular management reviews.

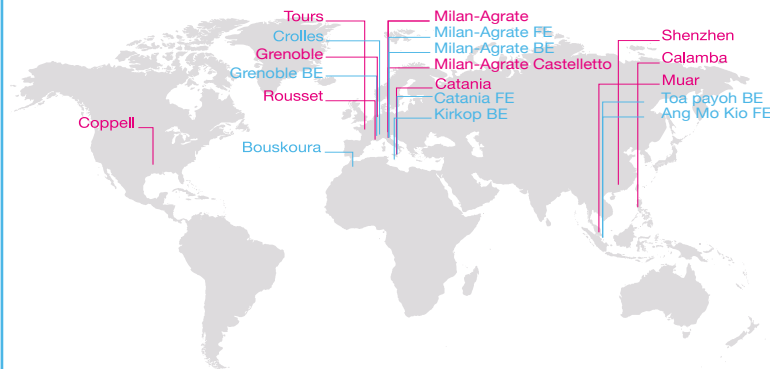


Proximity to our customers

To support new technologies, products, and solutions, ST operates 19 dedicated facilities all around the world. Product quality laboratories are centralized in each region in order to be close to our customers across the globe and offer short response times for customer issues or support requests.

GLOBAL INFRASTRUCTURE

19 facilities across the world



Product quality laboratories

Full analysis capability at product level to support activity from new product introduction to customer support

Manufacturing quality laboratories

Tailored analysis capability to support new technology R&D and manufacturing excellence

Responding to customer requirements

We work closely with our customers to ensure we fulfill agreed customer requirements. Using our review and approval process, we thoroughly analyze each of these requirements to make sure they comply with our company rules. Once a customer requirement is approved, we set up a formal contractual agreement that defines the rules for conducting business.

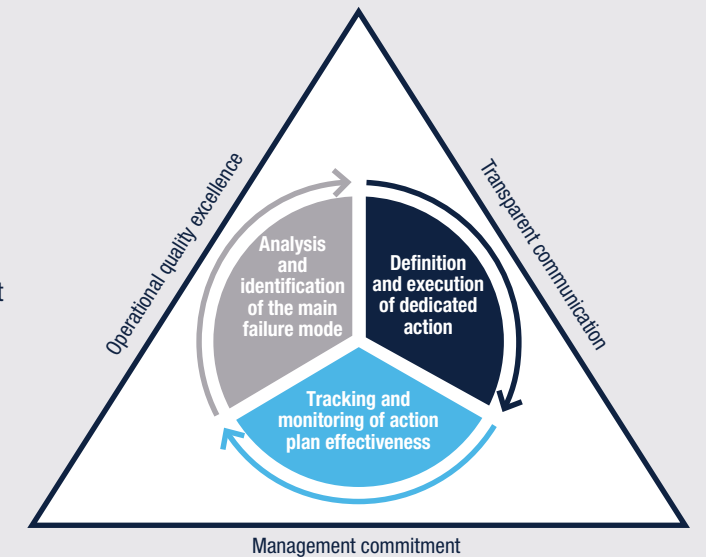
We support our customers by responding quickly and effectively to any demand that may arise, from product development to full production and beyond.

We keep them informed of the progress of their requests by providing them with interim reports followed by a final report. Finally, we log all information into our global system to ensure knowledge is shared across the organization and prevent recurrence.

The quality journey to customer satisfaction: A structured working model

To offer best-in-class customer support, ST has defined and implemented a structured working model and multidisciplinary approach that allows us to be always more effective in quality performance. Our model is structured around three core tasks: first, we analyze and identify the main failure modes, drivers, and priorities at the core of our customers' interest. Then, we define and implement a dedication action plan. Finally, we make sure to regularly track and monitor our action plan's effectiveness throughout the year.

Execution of the action plan is embedded in the global ST quality strategy, backed by strong management support. In this way, we align the quality community on committed targets, which are communicated transparently to the customer. Thanks to tight coordination and combined efforts between Corporate, Manufacturing, Groups, and Sales & Marketing, ST has built a standardized, innovative, and effective process with a highly positive impact on our relationships with our customers, all while successfully aligning our Quality organization. This structured working model will help us improve year after year, making sure we always achieve customer trust and satisfaction.



Vivavoce: Listening to the voice of customers

To amplify the voice of our customers in a way that can be understood by everyone in our business, we launched Vivavoce – a new program to communicate insights across all organizations, sites, and functions within ST.

Accessible via a digital portal, Vivavoce is structured into different sections for each target audience. Each section shows the latest information regarding customers, including customer satisfaction, any issues or complaints, and action plans. This data can be analyzed, queried, and displayed in different ways to suit the needs of the users, such as by customer, by region, and by ST organization, while fully respecting customer confidentiality requirements.

The aim is to create internal conversations and collaborations as part of our continual drive to identify improvement opportunities, share knowledge and enhance customer satisfaction.



Product and technology development



Quality is about our innovation and capacity to ensure the reliability of our products.

Marco Monti
President, Automotive and Discrete Group



Quality in product and technology development

From space to consumer products, from automotive to phones, ST semiconductors are found in millions of devices across the world. Because we are at the leading edge of R&D and innovation, it is essential that we keep developing high-quality, reliable technologies, packages, and products that fulfill customer requirements and expectations.

Our quality processes help us maintain quality and integrate robustness at every step of product and technology development, including product ramp-up and high-volume manufacturing. This allows us to produce competitive and innovative solutions with a fast time to market.

We use internal cross-functional technical networks to share best practices and develop our skills on key quality topics, such as the interaction between different manufacturing stages, failure analysis, reliability, and simulation/ modelization.

We deploy 'best known methods' for industrialization developed by task forces, such as die edge guidelines, ultra-low focus laser, and grooving optimization. We also use advanced testing and innovative detection solutions based on data analytics. Finally, we define and deploy innovative design for quality methods, such as enhancing functional and structural verification and improving the effectiveness of design checklists.



Quality is about striving to reach excellence in everything we do so that we earn and keep our customers' trust every single day.

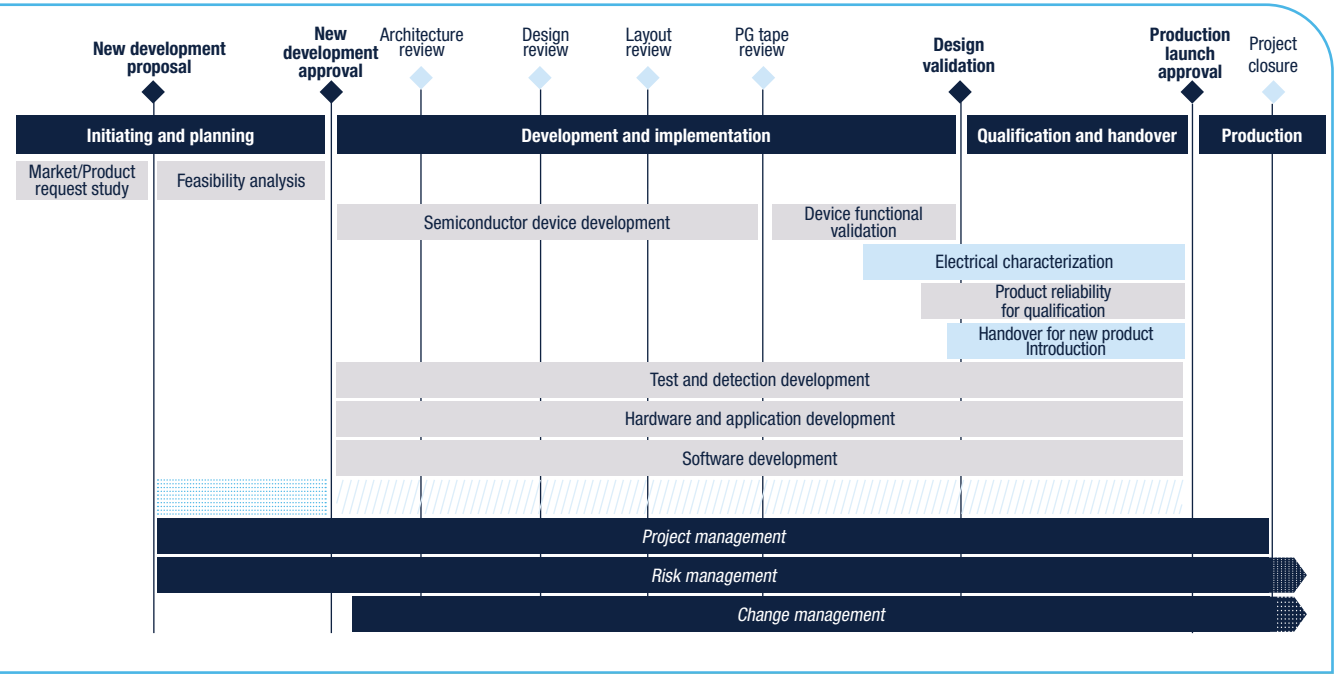
Remi El-Ouazzane
President, Microcontrollers and Digital ICs Group

Design for quality program and workshop

Corporate quality, together with the heads of design of our product groups and our product quality division, organized a workshop with 100 ST team members to work as "one ST" on quality in design. Attendees shared achievements and collected emerging needs, with the collective aim to increase quality from the very beginning of the product development process. Together, they defined new initiatives to be developed and deployed for future new product introduction.

This workshop is part of the operational aspect of the ST quality program and is therefore fundamental not only for quality but for the overall efficiency of our new product introduction process.

DEVELOPMENT FLOW



Quality is about working hard every day to meet and exceed customer expectations.

Marco Cassis
President, Analog, MEMS and Sensors Group Head of STMicroelectronics' Strategy, System Research and Applications, Innovation Office

Test revisioning and transfer to manufacturing (TRAM)

ST has implemented TRAM, a new tool designed to improve test change process management.

TRAM was built as a response to the need to manage changes to our test programs within a centralized, standardized system and to control approval of changes and the transfer to test machines used by our manufacturing teams. To meet these needs, we had to overcome several challenges: a wide variety of testers, using very different test programs, and coding methods and sizes that could vary from a few kilobytes to several gigabytes. To standardize this wide variety of ways of working, we developed TRAM, a standard configuration management system based on the continuous

integration and continuous delivery tool that allows automation of our processes. TRAM improves on our preexisting test change process management system by introducing new features: software configuration management for test program development and packaging with a centralized repository; controlled test program packaging, approval process and secure transfer to manufacturing; and automatic test program status updates, with automatic feedback from manufacturing.

TRAM ensures full traceability of our test programs, which are kept within a centralized database, allowing for faster retrieval in case of an external customer complaint. It is also integrated with our change management system, allowing for full, synchronized control of our change management. Finally, it results in automatic transfer to our plants, including subcontractors.

Manufacturing and supply chain



Quality is about building robustness into every step of product and technology development, manufacturing and supply chain.

Orio Bellezza
President, Technology, Manufacturing, Quality and Supply Chain

High-quality products and differentiating technologies

By building quality robustness into each of our technologies, we are able to offer differentiating products and solutions with high performance.

We take a systematic, proactive approach to continuously improve our manufacturing performance and knowledge-sharing.

To this end, we use a range of tools and processes, such as robust product and process qualification as well as VDA6.3 manufacturing and technology R&D audits. In addition, we analyze the system root causes of each excursion in order to share and implement improvements across all our manufacturing sites.



The power of teamwork and agile methodology

In 2021, our manufacturing teams successfully implemented two major initiatives to boost quality thanks to the work of a motivated, multidisciplinary team applying collaborative and agile tools, methods, and feedback.

The first of these initiatives, in assembly yield improvement allowed us to better meet our customers' quality, cost, and service requirements. It was achieved by systematically analyzing and segregating sporadic and chronic issues through a regular analysis of root causes. To this end, our manufacturing teams organized monthly meetings, defining and tracking actions with an action plan tool, and used the lean six sigma DMAIC and DOE methodology as well as manufacturing cells. This initiative powerfully exemplifies our STRIVE values, through continuous cross-fertilization and in-depth teamwork (with several working groups, technical communities, and regular reviews with groups focusing on customer requirements). Regular shop floor audits, flexibility

in the face of challenging targets and customer requirements, and a proactive approach helped increase our resilience, while improving quality and service as per customer expectations. Finally, our engineering and quality staff were reinforced, thanks to a strong people-training strategy.

Our manufacturing teams' second initiative allowed us to significantly reduce quality incidents by launching dynamic quality programs. Here, again, methodology played an essential part in their initiative's success: staff reinforcement and training, the use of lean six sigma, DOE, and 8D methodologies, manufacturing cells, and a bottom-up approach (based on feedback from our operators) helped increase ST's reactivity to customer expectations. Teamwork played a crucial part, through regular reviews with groups focusing on customer requirements, daily meetings, and the creation of multidisciplinary teams to deploy quality improvement programs.



Behind every quality product, robust materials and suppliers

We select suppliers based on their ability to meet our quality requirements and standards, as well as the way they treat their people, and their impact on the planet.

Building sustainable partnerships with our suppliers is a cornerstone of our approach to continually improving the quality of the materials we use. In addition to regular audits, we work closely with our suppliers to proactively prevent and solve problems, share knowledge and improve performance. In parallel, we constantly evaluate our own material and supplier management system.

Finally, we go one step further by partnering with select suppliers on joint R&D projects in order to develop the materials needed by applications such as 5G, space, or automotive systems.

New material supplier onboarding process

To provide guidance and rules for the assessment of new material suppliers, we have defined a unified process, to be used across all ST plants, for a systematic risk assessment approach. Because our goal is to protect our customers and to secure our business, our approach to supplier onboarding is multidisciplinary; this means it extends far beyond assessing material technical performance, looking instead at a much wider variety of criteria, including social responsibility, quality process and tools, environment, health, and safety (EHS), supply chain, and ethics.

For each potential new supplier, ST creates a supplier assessment board (SAB) composed of representatives of our GPO, product division, supplier quality community, corporate and central functions, and R&D/engineering teams. Suppliers are then asked to fill a self-assessment questionnaire before a kickoff meeting with the SAB. A final audit or visit of the potential supplier helps the SAB render a final decision. This thorough onboarding process allows us to ensure all our suppliers are aligned with our policies and requirements.

SUPPLIER AND MATERIAL MANAGEMENT



Reliability



A global approach to reliability

When it comes to product reliability, we rely on advanced reliability methods and processes, a solid network of experts, laboratories located at R&D sites and manufacturing locations, and dedicated IT tools to reinforce best practices and share knowledge, insights and activities related to technology, product characterization, and qualification.

Aiming for the highest quality standards

To accurately assess the reliability of our products, exceed their mission profile and guarantee they meet the highest standards of the semiconductor industry, we use accelerated stress testing during qualification exercises. Test conditions are carefully defined according to the customer

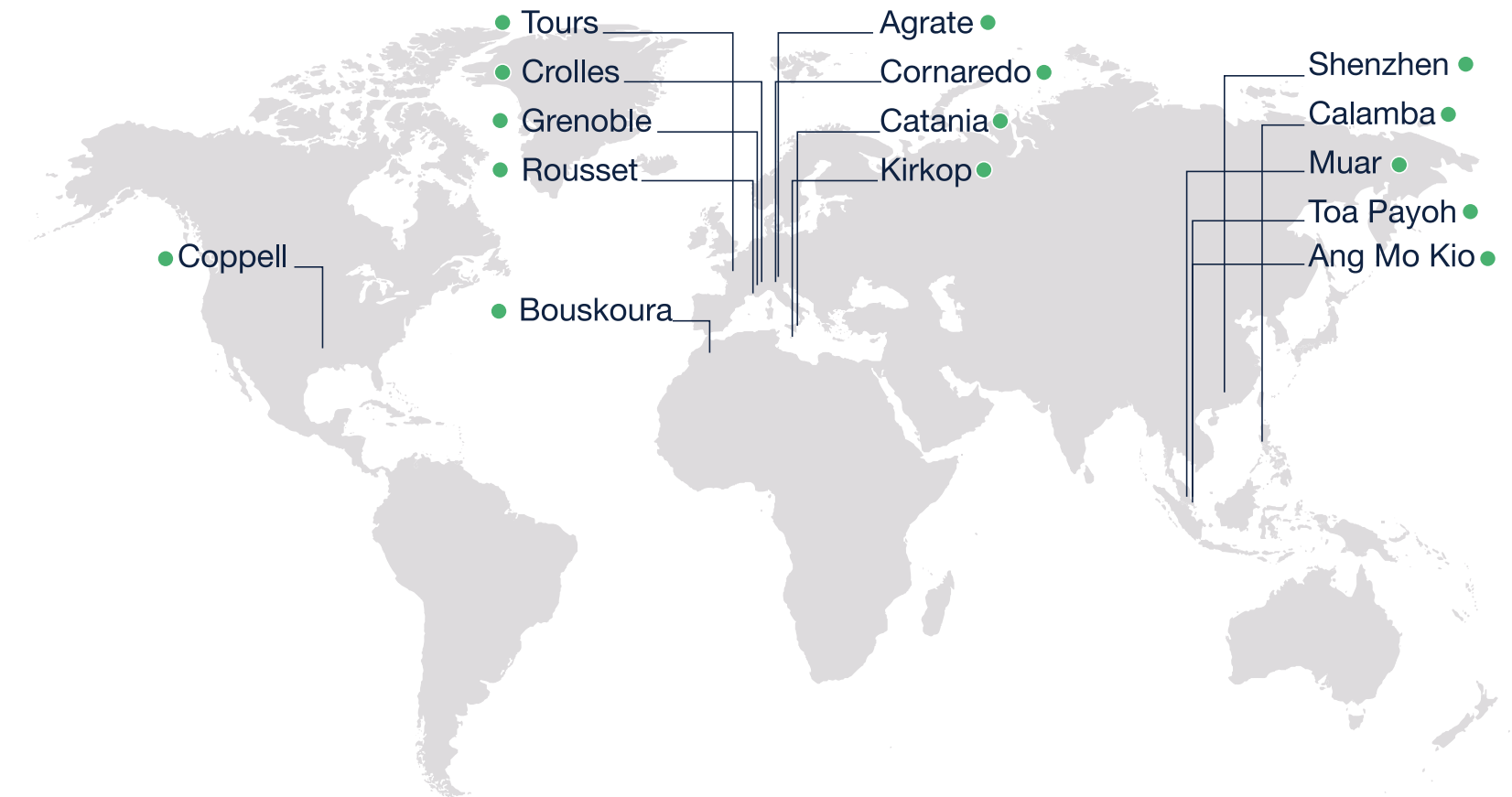
mission profile to accelerate the failure mechanisms that are expected to occur under normal use conditions. This enables us to estimate component reliability under use conditions and identify ways to increase reliability, with the aim of ensuring zero failures during the product's lifetime.

Establishing a best-known method for cases of intermetallic wire bonding and pad corrosion

ST's approach to reliability is steeped in company-wide knowledge-sharing. ST recently created a dedicated best-known method (BKM) procedure for cases of intermetallic wire bonding and pad corrosion. This initiative aimed to complement our existing cross-fertilization and prevention process in order to ensure that the best-known methods for prevention are systematically collected, documented, and deployed when this specific high-impact failure mode arises.

To this end, we identified and described the issue at hand. Then, we collected existing BKMs for prevention and consolidated them into a dedicated procedure, to be updated continuously. Finally, we released and are deploying this BKM procedure and will monitor its efficiency and effectiveness. In the future, this initiative will allow us to capitalize on problem-solving knowledge and ensure a quick, effective response in case of potential issues.

RELIABILITY LABORATORIES



ST reliability seminar fosters sharing of technical knowledge among reliability experts

ST hosted its first company-wide reliability seminar, bringing together the ST reliability community of technical experts from R&D, Manufacturing, and Product Groups. ST reliability experts presented state-of-the-art innovation topics, in addition to a keynote from a university professor and reliability expert from the Institute of Electrical and Electronics Engineers (IEEE). The seminar, organized by Product Quality & Reliability, was an opportunity to increase knowledge-sharing and knowledge management on this critical aspect of our quality operations and to reinforce team spirit and collaboration amongst people working in technical reliability functions.



Quality innovation

Experimenting to enhance quality

ST is a technology company driven by innovation. Our technology developments are guided by the long-term market trends enabling or enhancing applications for the end-user by turning state-of-the-art chip fabrication technologies into cutting-edge commercial products.

We create unique technologies and products that provide our customers with the best solutions to address their challenges and opportunities.

In this same way, our quality is also innovation-driven.

- ★ We design and implement new approaches and solutions to boost quality, such as machine learning and algorithms for improved detection of potential issues.
- ★ We use leading-edge quality solutions to ensure the reliability and quality excellence of the highly complex technologies and products we design for our customers and build customer trust in ST as a sustainable, innovative business partner.
- ★ We are constantly seeking for new, innovative ways to meet our customers' ever more challenging expectations and requirements, in a fast-paced, transforming environment.

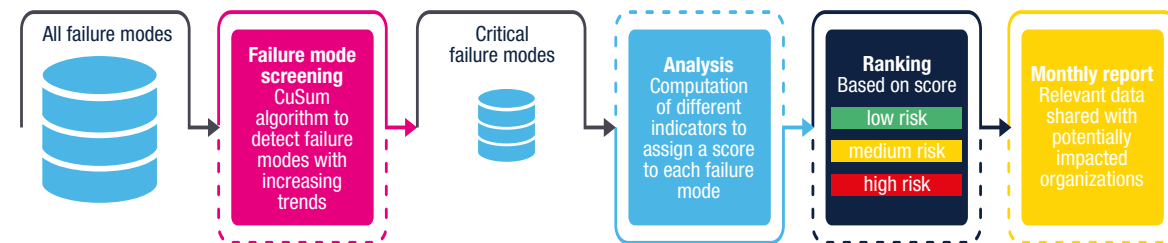
CuSum: an innovative way to detect main failure modes early

To improve the early detection of potential failure modes, ST is applying an innovative solution: CuSum, an algorithm that automatically detects those failure modes that are causing an increasing number of issues.

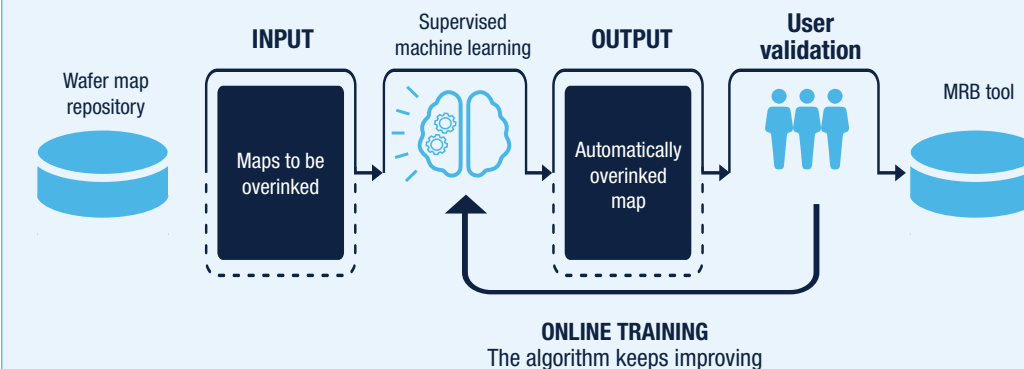
ST defines and performs a periodical, structured, and global analysis of all customer issues, company-wide, in order to provide an objective picture of the most critical of these issues and detect potential risks as early as possible. To this end, we categorize data based on failure mode, defined as a combination of the point of failure and defect itself. Then, using CuSum, a change-detection algorithm, we automatically select and analyze those failure modes that show an increase in the number of monthly closed cases. Finally, we assign a risk level to the selected failure mode, based on ppm values, the products, technologies, or plants involved, our level of understanding of the failure mode's root causes, and the presence of corrective actions. In case of a potential risk, warnings are shared with relevant organizations.

With the implementation of CuSum, ST is able to automatically process customer issues and effectively extract potential criticalities. CuSum also provides us with an objective and global picture of the main failure modes found in customer complaints, helping us to continuously improve the quality of our products and solutions.

FAILURE MODE EARLY DETECTION



MACHINE LEARNING DATA FLOW



Automatic overink: Using machine-learning to support our decision-making process

Data science and artificial intelligence offer new, innovative opportunities to increase quality across all ST organizations. ST's use of machine-learning to automatize overinking exemplifies this approach. When a lot is declared nonconform, a group of experts, the Material Review Board (MRB), traditionally conducts a risk assessment analysis, which can result in a decision to manually overink wafer maps. This tends to create long cycle times for the MRBs, additional costs, and a risk of subjective discrepancies. To improve this process, ST implemented a classification-based machine-learning approach, which will help MRB teams by suggesting overinked wafer maps based on previous overink decisions.

This project will effectively digitalize the manual overinking process and provide quick, reliable automatically generated overinked maps, in order to increase efficiency and support decision-making. The end-user can then edit the proposed maps and validate them. Once this project is industrialized, it will be plugged directly into the MRB tool used to manage nonconform lots, providing a prime example of the added value of machine-learning-based innovation in quality.



HoloLens: an innovative response to the challenges of the Covid-19 pandemic

The remote work policies and travel restrictions enforced during the Covid-19 pandemic created a new set of challenges for ST, starting with finding a way to conduct factory audits remotely. Our response: The HoloLens smart glasses, a virtual reality (VR) headset which allows remote experts, such as maintenance and equipment manufacturers, to effectively 'see through the eyes' of front-line workers and offer advice and instruction. The HoloLens smart glasses help our employees work together more efficiently when travel is impossible, saving both time and money. Its potential applications extend far beyond the specific context of the pandemic, creating new opportunities for ST team members. The successful implementation of the HoloLens solution reflects ST's resilience and ability to design innovative solutions, work together, and always bring more value.

Product control plan (PCP): implementing an optimized, ST-wide solution

In 2021, ST launched PCP, a company-level product control process. It is the result of an engineering and management decision to define the most optimized product detection strategy and coverage to be applied in production. To implement PCP, we put in place a multi-functional team to work on a common set of selection criteria for critical quality parameters. We then validated the proposed algorithms and datasets designed to support the varying needs of our different business organizations. The PCP is also covering new criteria to tackle early failures through a library of stress tests.

The PCP consolidates our product detection strategy and is fully integrated in the ST product development process. It is based on one single set of critical parameters for testing; one set of algorithms, data analytics solutions, and automation solutions to execute at testing plants; and one unified ST-wide process.

The PCP thus provides us with a unique, company-wide process for controlling our test and detection strategy. In turn, this helps us reduce test escapes and related quality events, foster the cross-fertilization of our corrective actions, and improve the quality of our products and solutions.

Culture, values and expertise



Quality is about transforming processes, behavior and culture to continually improve.

Rajita D'Souza
President, Human Resources and Corporate Social Responsibility

Strengthening a shared quality culture

Our 2021 employee engagement survey confirmed our commitment to fostering a culture of quality: 86% of our employees said they clearly understand how quality expectations fit into their job requirements, placing ST 13 points above the global industry average.

Using culture and values to increase quality

Quality is a responsibility shared by everyone at ST, from our CEO to our most recent recruit. We seek to excel in quality by cultivating a strong company culture that relentlessly pursues excellence and by developing our workforce of highly skilled, disciplined, and engaged people.

Our culture is founded on our STRIVE for Excellence values, which are supported by our top management and shared

throughout our company: Strength, Teamwork, Resilience, Innovation, Value and Expertise.

Growing with our people

We continuously invest in our people, offering them quality-focused training and development, including employee induction, job skills training, and certification. We bring people together in cross-functional quality networks to encourage the sharing of knowledge, experience, and good practices. Dedicated expert networks support key quality domains, such as prevention, failure analysis, problem solving, and Lean.

Additionally, during our yearly ST quality week, ST sites organize company-wide events, with the participation of ST management and of our customers. Their contribution fosters quality knowledge-sharing and cooperation across the company

The STRIVE awards: recognizing outstanding quality initiatives to boost quality culture

To foster quality culture, ST organizes the yearly STRIVE awards, an initiative that showcases ST quality at its best by recognizing outstanding achievements by teams and individuals working on quality initiatives.

In 2021, ST quality leaders selected 54 initiatives from Front-End and Back-End Manufacturing and TR&D organizations, product groups, regions and Corporate PQR, in categories as diverse as customer satisfaction, product quality excellence, technology and manufacturing excellence, and quality strategic initiatives. The STRIVE awards highlight the role of quality as a key business enabler for ST, and all ST organizations are encouraged to capitalize on these great achievements and tell other interested parties about them.

Additionally, the STRIVER awards recognize individuals who embody the STRIVE values (Strength, Teamwork, Resilience, Innovation, Value creation and Expertise) in their work. Through these awards, ST organizations aim to highlight outstanding achievements in their Quality perimeter, beyond the scope of standard activities. To create optimal engagement and underscore the importance of quality to our business, our executive management team took part in a series of online videos, sharing the importance of quality and our STRIVE values.



Building expert networks to improve quality: The technical committee for product quality analysis

Expert networks support key quality domains, ensuring state-of-the-art knowledge is shared and cascaded. Because our products and technologies are continuously rising to new challenges, product quality analysis is becoming increasingly complex and drawing on a wider range of skills than ever. To ensure that we continue to grow our capabilities, ST has established a company-wide technical committee on this topic. This committee aims to engage experts across all ST organizations to accelerate innovation, development, and knowledge-sharing in product quality analysis. Led by a core team, it supervises a group of over 40 experts from different teams and sites, offering them training and organizing a series of webinars and workshops on the subject.

By streamlining efforts and disseminating knowledge while encouraging creativity, this governance initiative is helping us build the next generation of in-house product quality analysis experts. Further down the line, it will enable us to address future technical challenges and continue to guarantee the highest level of quality for our products and solutions.

To create optimal engagement and underscore the importance of quality to our business, our executive management team took part in a series of online videos, sharing the importance of quality and our STRIVE values.

Our culture is founded on our **STRIVE for Excellence** values of Strength, Teamwork, Resilience, Innovation, Value and Expertise.



Management system governance



Quality is about increasing value for our customers and our company.

Lorenzo Grandi
President, Finance, Purchasing, ERM and Resilience Chief Financial Officer

A resilient organization that pursues excellence

Our quality management system enables our business strategy and is rooted in our main ambition: to satisfy our customers. It is supported by robust governance, helping us ensure we offer our interested parties the highest level of quality excellence.

The three pillars of our management system governance

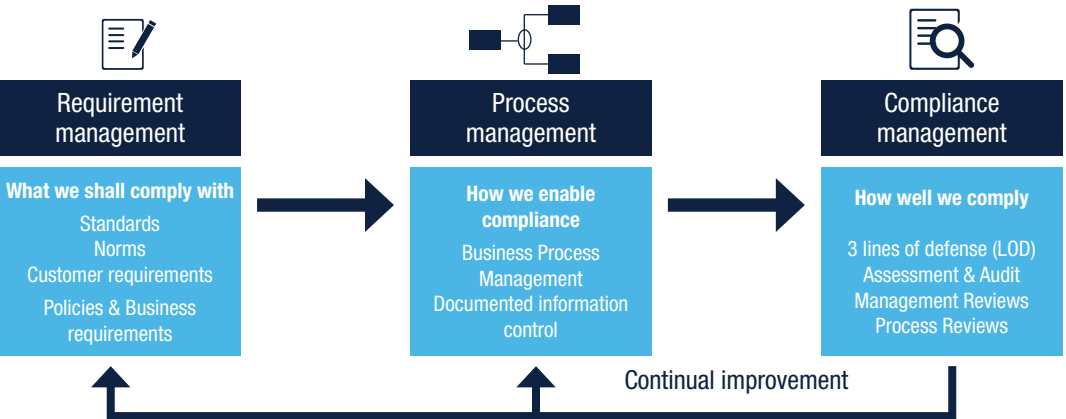
Stakeholder requirements include legal norms, industry standards, and the needs and expectations of our customers, employees, suppliers, and shareholders. At ST, management system governance ensures they are embedded into each of our policies and business processes. To this end, we first identify and describe these requirements, then make sure they are reflected in all ST processes and controls. Further down the line, we run assessments and audits in order to verify that process

execution complies with stakeholder requirements.

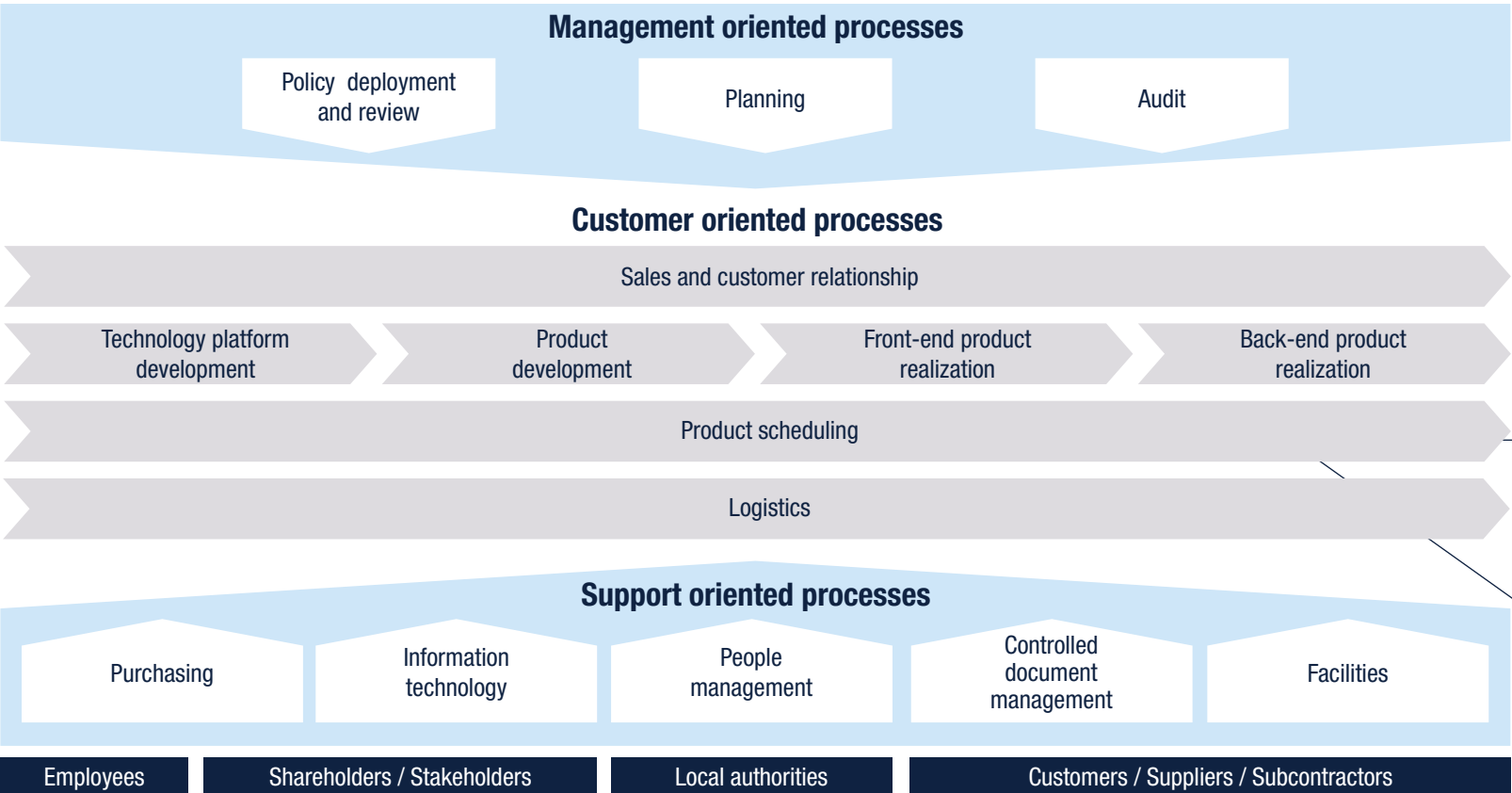
We are currently transforming our governance system to improve ST productivity, ease process management, and ensure compliant and robust execution. In parallel, we are aligning our system to the three Lines of Defense (LOD) standard, a risk governance framework deployed in ST by our corporate risk organization.

This ongoing transformation of our governance system will impact and improve each of the 15 interrelated key processes (management, customer-, and support-oriented processes) that make up our quality management system.

THE 3 STRATEGIC DRIVERS OF MANAGEMENT SYSTEM GOVERNANCE



ST KEY PROCESSES



Implementing our third Line of Defense (LOD): Compliance and execution excellence

Under the Three Lines of Defense framework, the first LOD implies that the team members in charge of executing our business processes are responsible for assessing their own compliance with said processes, which are, by essence, designed to address stakeholder requirements. The second line of defense consists in our process owners monitoring process compliance and execution, i.e., providing guidance and support in adopting the process, while measuring its effectiveness. Independent reviews and audits make up the third line of defense, risk assurance.

ST is now working on the implementation of the third LOD, with a corporate team that will independently assess compliance and execution of key processes and stakeholder requirements.

Quality digital transformation

Transformation of customer complaint management

At ST, we implement our quality digital transformation with the involvement of all concerned stakeholders. We recently overhauled our customer complaint management system, with the aim to create a leaner process that would allow us to optimize cycle time and increase the quality of our customer reports. To do this, we worked to modernize our existing processes, promote better integration with other tools, and reinforce data integrity and availability.

We prototyped and developed our new solution using an agile approach, design thinking, and end-to-end testing. Combined with the high-level expertise of our skilled users, we were able to create and implement an improved system based on a streamlined process. In turn, this allowed us to increase our performance and cycle times, achieving higher customer satisfaction.



Leveraging the power of data

ST Quality digital transformation, as part of the company digital transformation, is a key enabler to help us improve and deliver more value to our customers. Our quality processes are built to support the availability of information data, streamline processes and simplify operations, and better integrate solutions and intelligence.

Digital transformation involves making information available digitally, using digitized

information to simplify operations, and devising new business applications that integrate both these digitized data and digitalized applications. When applied to quality, digital transformation processes and quality solutions help everyone at ST make better decisions and improve our problem-solving skills, using artificial intelligence and projection models.

Real-time data analytics

Thanks to our digitalized processes, we have designed a dynamic dashboard that collects and centralizes data, which is then available for all ST team members involved in our key business processes (manufacturing, reliability,

sales...). This dashboard extracts dynamic data in real-time, helping us analyze trends over time and make well-informed decisions based on precise information. This creates a virtuous cycle where data generated by our activities is analyzed, then used to support the improvement of these activities.

Because the goal of our quality digital transformation is to ensure customer satisfaction and modernize our existing processes, we strive to always work in agile mode. Whenever we are developing a solution, we make sure to work with all stakeholders (internal clients, corporate functions, application suppliers) and ensure that our flows always comply with norms and customer requirements.

Using algorithms to improve prevention

At ST, quality digital transformation also means using algorithms to anticipate or project potential issues. We use algorithms to make predictions, then compare the actual data with our previous projections to assess the efficiency of our preventive actions. This helps us continuously improve quality and maintain customer satisfaction and trust.

The quality portal, an innovative digital transformation initiative

To leverage the power of data to work towards our quality objectives, ST has launched a quality portal, with an aim to provide all ST organizations (sales, manufacturing...) with access to standardized indicators. The quality portal is a centralized source of data, refreshed daily, and easily accessible in a standardized way via ST computers and phones. To create this portal, we defined key performance indicators (KPIs) for our quality and reliability processes and ensured all our organizations aligned on these KPIs. Then, we standardized these indicators within the portal itself, creating a one-stop shop for anyone looking to view corporate referenced indicators for the main quality processes across ST organizations.

We went one step further by creating specific modules for advanced analysis of our quality and reliability processes, using the quality portal to drill down on our activities. The portal supports our quality objectives in multiple ways: the ability to share standardized information across all organizations promotes improved knowledge-sharing across ST and helps us make more informed decisions on a daily basis.



Envision Quality 2025



Building ST's quality future

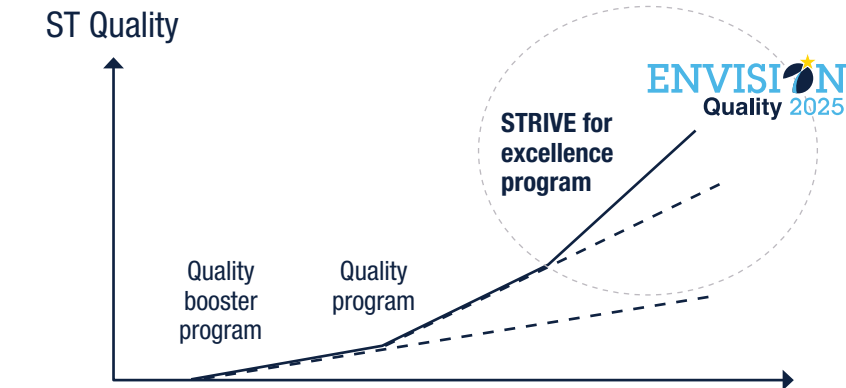
What comes next for ST quality? How can we continue to improve our KPIs to ensure quality excellence for our customers and interested parties?

These questions are at the heart of Envision Quality 2025, a worldwide, three-day meeting held in June 2022. Envision Quality 2025 brought together quality leaders from all product groups, sales regions, and manufacturing sites to review the achievements of our quality program so far and define our direction for the future.

Participants attended several workshops (on product development, technology, R&D and manufacturing, customer voice, benchmarking, value proposition, and people) and work to produce a SWOT and action plan. Our aim: to leverage and cross-fertilize our expertise and build a "STRIVE for excellence" quality program for 2025 that will help us address gaps, capitalize on opportunities, and develop innovative solutions, so that we may continue to achieve quality breakthroughs in the future.

QUALITY CONVENTION: ENVISION QUALITY 2025

- ★ Prepare quality vision, strategy and STRIVE for excellence program for 2025
- ★ Expertise leverage and cross-fertilization
- ★ Reinforce quality as a unified entity



6 Workshops

Leveraging expertise	Product development	Technology and package R&D, manufacturing	Voice of customer
Positioning quality	Benchmarking	Value proposition	People



S trength
T eamwork
R esilience
I nnovation
V alue
E xpertise



Find out more at www.st.com/quality

For more information on ST products and solutions, visit www.st.com

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