Data and Technology

We are working to offer personalized and accurate solutions and increase operational efficiency through integration of artificial intelligence, big data and machine learning in our systems. We are increasing the agility and strength of our technological infrastructure.

RELATED INDICATORS	2021	2022
Awareness programs on customer privacy and information security	17	**20**
Cybersecurity training hours per FTE	70.9%	**86%**
Training or information provided on external fraud (Number)	108	**128**
Number of UGİ Smart Assistant Interactions	26,4 million	**53,3 million**
Number of queries answered by Bilge (The Wise) and Kobilge (for SMEs) Employee Chatbots	484 thousand	**550 thousand**
Value-added projects using Big Data and Machine Learning	62	**77**
Number of Customer Behavior scenarios analyzed on Complex Event Handling Platform	104	**121**
Number of RPAs in Production Medium	42	**120**
Number of Annual Transactions Going Through Internet and Mobile Banking Channels	780 million	**1,1 billion**
Number of Garanti BBVA Log-ins	2,7 billion	**3,7 billion**
Number of Cardless Transactions Going Through Garanti BBVA ATMs	82 billion	**119 million**
Market share in QR transactions	36%	**37%**
Digital channel share in non-cash transactions (Individual)	92.2%	**97.6%**
Share of digital sales in total sales (Individual)	84%	**86%**
Projects using Data Science Suite	15	**30**

The advancements in technology and the arrival of new players such as fintechs expose the finance sector to a faster-than-ever transformation. For proactively responding to this transformation, we are taking action quickly. We have redesigned our way of doing business with agile methodologies in order to introduce new products and services swiftly. The Bank is operating more than 400 agile team disciplines, including particularly 100% of the technology organization.

With its uninterrupted investments in technology ongoing since the early 1990s, Garanti BBVA has erected its digital transformation strategy on offering a full-scale and integrated banking platform encompassing simple, accessible and personalized banking transactions and services. In this context, it is always a priority for the Bank to listen to customers' needs and respond to them in a prompt manner.

We are transforming our way of conducting work and automatizing our processes with Business Process Management **(BPM)**, Process Mining **(PM)**, Intelligent Document Processing **(IDP)** and Robotic Process Automation **(RPA)** technologies. With the solutions created, we are building **agile work processes** that render capturing and automatizing development and automation opportunities a part of the life cycle.

With our **Intelligent Document Processing (IDP)** solutions backed by advanced OCR technologies and artificial intelligence models, we are digitalizing identification documents, contracts, instructions and similar documents and integrating them in our business processes.

For more focused and targeted Information Security, our Information Security Governance team is divided into two main domains, namely **"Data and Infrastructure Information Security"** and **"Application Solutions Information Security".** This action that will enable deepening in the specialty area provided a more productive working domain in infrastructures and project developments.

Within the scope of Data Security, we positioned our applications developed by various teams under our **"Security Solutions"** team focused on software organized under Corporate Security roof. This allowed satisfaction of life-easing needs of our internal customers and of those we, as Enterprise Security, need in our own business processes from our internal resources within a more consolidated structure.

The opportunities offered by digitalization also make data protection and security issues one of the most important risks. Taking precautions against all risks, which could prevent secure and uninterrupted service, particularly cyber threats, **ensuring information security and informing customers on related issues are among** the material topics, both for Garanti BBVA and its stakeholders.

Identity and Access Management function that is of an ever-increasing importance was reviewed end-to-end and reorganized as a separate unit composed of broader and more-focused teams. This move separated Access Management, Identity Management and Authorization Operations functions, resulting in their more focused management.

In terms of governance, the Information Security Committee headed by the CEO coordinates all efforts within the Bank to guarantee information security, and monitors policies, procedures, and regulations. For alignment with the new regulation that went into force in 2020, Information Systems Security team operates within an organizational structure whereby it reports its activities directly to the CEO.

Turkey's first bank to centralize its operations, Garanti BBVA alleviates the operational load on its branches and head office units, and enhances employee productivity through active use of technology. The Bank ensures superior quality, timely and error-free execution of operational transactions of its millions of customers with **ABACUS**. Garanti BBVA channels **88% of all operational transactions of branches to ABACUS made up of a dynamic team of 1,543 experts. ABACUS handles a total transaction turnover of USD 427 billion.**

DEVELOPMENTS IN 2022

Target

Action Taken

Automatization and more efficient handling of **operational transactions** with low added-value, **better customer experience** with **minimum errors** and at high speed

- **Robotic Process Automation (RPA) technology implementation:** As a result of RPA initiatives, nearly 250 processes were identified to date, and the number of processes developed using RPA reached 120 in total.
- 23 new tools were introduced on a single platform for facilitating security controls of the entire Garanti BBVA Group, for automatizing tasks and allowing them to be run on self-serve basis so as to allocate the workforce to more productive areas.
- **ARK Platform:** The ARK Platform allows developers to develop banking and affiliate applications using agile methodology, accelerates value creation thanks to use of modern technologies, and reduces costs owing to the cost advantage of open system technologies. The work related to the platform commenced in 2019, and the first application was taken into production on the platform by mid-2020. In 2022, 94 applications were taken into production, bringing the total number to 158. Through these applications, an additional 8% of transaction load of the existing architecture was transferred to the platform for a total of 20%. 70% of the developer resource was trained with new platform capabilities. In 2023, the transformation will continue to expand, and the platform will gain broader usage.

Maintain deeper and value-adding relations with customers, expand the customer base, **increase product/service sales volume** and accelerate customer digitalization

- Looking at 2022 activities in relation to the **Ruler** (CEP-Complex Event Processing) initiative commenced in August 2018, behaviors of Garanti BBVA customers on any channel or in branches can be detected both instantly and on the basis of trails on the system, and the best-fitting action can be taken in real time.
- With its personalized customer journey capabilities, Ruler processes an average of **nine million customer behaviors** daily using 121 scenarios through digital channels and branches, and **enables four million direct customer contacts.**

Maintaining external fraud risk management activities focused on customer security and experience

- Data-based and artificial intelligence-supported decision-making processes regarding external fraud cases are carried out to minimize possible bank and customer losses. Data-based and artificial intelligence-supported decision-making processes were strengthened with 4 different analytical models.
- Importance is attached to information sharing among different sectors and institutions for preventing external fraud risks within the ecosystem.
- Channels and methods continue to be increased which are used for informing customers about fraud trends and important considerations.
  - 68 million customer briefs using 10 different methods
  - Gamification Security Test with UGİ
  - Instant Customer Alerts on Mobile Banking frontend
- Personnel information and awareness initiatives are carried out. Training or briefing programs on external fraud numbered 128 in 2022 (2021: 108)

Create a structure enabling customers to track data on their multiple accounts and POS devices on a single screen within the scope of **Open Banking**

Within the scope of Open Banking initiatives, retail customers, sole proprietorships and corporate customers are now able to integrate other banks' accounts through mobile and Internet Banking channels. Developments are now finalized which will allow sole proprietorships and enterprise clients to view the POS movements with another bank on the mobile and Internet Banking channels.

Offer **smarter, customizable solutions** faster for clients

Artificial intelligence, machine learning and big data applications:

- In 2022, **new machine learning and deep learning models** were integrated into Garanti BBVA systems in 77 projects.
- "Data Science Suite" functions were enriched with the **"No-code/Low-code"** platform development, which brought the number of individuals competent in data science at the Bank to over 100. Value was created through 30 additional projects put into use quickly in 2022 with this application.
- Algorithms, which make predictive modeling that feed business decisions explainable, were integrated.
- Monitoring mechanism was automated to observe time-varying accuracy of the prediction models.
- The adaptive structure that provides automatic self-renewal of prediction models that downslide in time was automated and put into broader use.
- In order to quickly respond to customer needs, software development and production processes were reviewed end-to-end, and their effectiveness was increased and uniformity was secured in code structures. (MLOps)
- **Personalized offers to customers are being enriched** with the introduction of the graph theory and the technologies developing around it in 2022.

To expand data-driven decision-making culture, **1,200 participants were supported in their development through 18 internal training** programs given in areas such as artificial intelligence, machine learning, deep learning, chatbot and data modeling.

70 students were educated in Computational Data Science, which was started to be offered as a credit course at İstanbul Technical University from 2021 with the aim of supporting the society's competence in artificial intelligence and machine learning.

Ensure **customer privacy** and **information security**, eliminate external fraud risks

- Work was initiated for reorganizing **Garanti BBVA Cyber Security Center** in view of current threats and technological novelties and for turning it into a structure capable of responding to the future needs now.
- Tools were developed to ensure and expand data security, and infrastructure projects were continued to increase the reliability of the infrastructure.
- Dealing with external fraud holistically within the framework of the principles of customer protection, Garanti BBVA manages frauds for card transactions, account transactions, POS transactions and loan product applications made through all branches and non-branch channels in a customer-centric manner. The Bank examines the risks of external fraud in new products and processes developed by Garanti BBVA, and offers opinions and suggestions

Sustainability for Firms	Carbon footprint calculation and sectoral impact analysis can be shown on the Internet channel for sole proprietorships and enterprise clients.
Live Chat service for the hearing-impaired	• Garanti BBVA brings its hearing-impaired customers together with the Live Support Assistant easily and quickly with the "Live Support" service offered on Mobile. • Customers prompting to be put through to the live support assistant are prioritized in the queue.
Support customers' digital transformation	• Garanti BBVA Mobile customers who are new to the bank are presented with a welcome screen where they can quickly access their account and card information and frequently performed transactions with the smart assistant UGI. • The instruction process issued by Private Banking customers by placing a call from the onsite phones in branches is transported to the mobile app. • Customers can issue the instructions necessitating a wet signature by connecting to their PB CRMs, subject to their availability, using the "secure" mobile channel's video chat function, thus branch visit requirement is minimized. • Certificate of Acceptance for Export Price that is mandatory for exporter customers can now be produced on digital channels. • For sole proprietorships and enterprise clients, Discounts, Interbank-Indexed Credit and Installment Commercial Loan products were also made available in 2022 following the SPOT and bank overdraft loans in 2021.

2023 FOCUS AREAS AND PRIORITIES

- In 2023, the main focus will be on Data Security and Identity Management. Planning started for programs that will be run in this framework.
- End-to-end improvements will be continued for systems and processes for producing fast solutions to customers.
- "No-code/low-code" platform functions will continue to increase with the addition of Data Science Suite, data preparation and new algorithms.
- Enhanced customer satisfaction and increased operational efficiency are targeted thanks to faster and higher quality processing of customer instructions using image and text processing capabilities in smart document processing.
- Reinforcement learning techniques are planned to be installed in business decision support systems for enhancing customer experience and personalized offers.
- The power of artificial intelligence and machine learning will be made use of more broadly in our products and services that touch the customers and in the development of differentiating innovative approaches and solutions in our business processes.
- Garanti BBVA will keep spending efforts to ally with customers on the back of process security approach and dynamic risk management against the evolving and increasing fraud risks in the ecosystem and continue to work towards providing a convenient and seamless environment to its customers for the fulfillment of their financial needs. The Bank will continue to offer the setting for secure transacting of its customers with its fraud risk management systems bolstered with state-of-the-art technology and analytical methods and its competent team.

RISKS AND OPPORTUNITIES

Risk	Our Response
Responsible use of AI	Responsible AI principles are adopted when developing solutions on Big Data and Artificial Intelligence. Garanti BBVA pledges to be committed to Human Rights and not to discriminate, as stipulated also in the Garanti BBVA Code of Conduct. None of the analytical solutions employed in customer acquisition, pricing, recruitment and remuneration uses data pertaining to gender, color, ethnicity, disability, religion, sexual orientation or political affiliation. Garanti BBVA plans to operate new control mechanisms in artificial intelligence projects to generate unprejudiced and unbiased results.

Opportunity	Our Response
New Data Sources	Cooperation will be established for new data sources that will allow us to better understand our customers and thus, to offer better products and services.
DIY options	Investments in the "No-code/low-code" platform developments will continue.
Automatization	• Software and production processes will continue to be automatized. • Customers will be offered faster service with the spreading of smart document processing tools.
Current Technology and Analytical Methods	• Data classification model was reworked as part of EBA (European Banking Authority) and BRSA harmonization efforts with respect to fraudulent attempts, and cautions to be adopted for data protection were determined. • Proactive risk management, personalized customer experience, reinforced technology.