BİLGEM within TÜBİTAK
BİLGEM within TÜBİTAK

- R&D Activities
- Research Centers
- R&D Support Units
Short History of BİLGEM

- 1963: TÜBİTAK
- 1968: EAÜ
- 1991: YİTAL
- 1995: BTE
- 2010: UEKAE
- 2012: İLTAREN
- 2012: SGE

TBAE, YTE
Main Activities of BİLGEM

1. Research and Development
2. Testing and Evaluation
3. Prototype Production
4. Consultancy
5. Training
BİLGEM Operation Fields

- Information Technologies
- Information Security Systems
- Cryptology Systems
- Cyber Security Technologies
- Secure Communications Technologies
- Homeland Security Systems
- Explosive Detection Systems
- Electronic Warfare Technologies
- Underwater Defense Systems
- RF and Microwave Systems
- Radar Systems
- Antenna Systems
- Sensor Systems
- Intelligent Transportation Technologies
- Avionics Systems
- Civil Aviation Technologies
- Simulation Technologies
- Real-Time Operating Systems
- Chemical Transformation Technologies
- Cloud Computing Technologies
- Electro-Optic Technologies
- Laser Technologies
- Micro-Electronic Technologies
- Biotechnologies
- Testing and Evaluation
The mission of TÜBİTAK,

Inventing technologies that have never been discovered in Turkey, reducing the country's technology dependence on foreign sources bringing out these technologies up to technology level 6 (prototype level) to make technology transfer to our industry.

TÜBİTAK performs projects and mass production in situations that, any institution does not, can not or should not do.
BİLGEM Milestones

- 1st Semiconductor research and production lab of Turkey (1980)
- 1st Microchip production (1983)
- 1st Military & Civilian Voice and Data Encryption system provider
- 1st Crypto Systems developer & implementer of Nation-wide Military Telco Network (TAFICS)
- 1st NATO approved cryptographic algorithm (2000)
- 1st Time in history, NATO and Russian ships communicated in a secure Encrypted Environment (2006)
- 1st NATO Sole Source delivery of secure USB flash memory storage device (2007)
- 1st COMSEC Laboratory
- 1st International Common Criteria Laboratory (2009)
- 1st National Secure Military Messaging system provider
- 1st Satellite Crypto Module provider (Göktürk-1) (2016)
- 1st Electronic Warfare Research Center (2000)
- 1st Public Key Infrastructure provider (2005)
- 1st Electronic Signature System provider (2005)
- 1st National ID Card and Smart Card Operating System designer and provider of Turkey
- 1st National Command and Control System for National Corvette (MİLGEM)
- 1st National Combat System Simulation (DATAS)
- 1st Real Time Operating System for Critical System Provider (GIS)
- 1st Linux Based National Operating System PARDUS (2007)
- 1st CMMI Level 5 Government Institute (2017)
How to Work with BİLGEM?
Messaging Systems
Messaging Systems

MIS
MESSAGE OPERATING SYSTEM

MEDAS
MESSAGE AND DOCUMENT DISTRIBUTION SYSTEM

MAMSİS
NATIONAL MILITARY MESSAGING SYSTEM

KurumNet
SECURE CORPORATE MESSAGING SYSTEM

FORESC
NATO Black Sea Exercise

- MİLGEM 1 Heybeliada
- MİLGEM 2 Büyükada
- MİLGEM 3 Burgazada
- MİLGEM 4
- Test and Training Ship
- LST
- LHD
- New-type Submarine
- Heybeliada
- Büyükada
- Burgazada
- MİLGEM 1
- MİLGEM 2
- MİLGEM 3
- MİLGEM 4
- Test and Training Ship
- LST
- LHD
- New-type Submarine
- FORESC
- NATO Black Sea Exercise
- KurumNet
- SECURE CORPORATE MESSAGING SYSTEM
Crypto Systems
Encrypted Communication Systems

- **EKADAS-II**
  - Electronic Crypto Key
  - Management and Distribution System

- **MILSEC-4**
  - Secure IP Terminal

- **IP Crypto Devices**
  - 1 Gbit/s
  - 10 Gbit/s

- **KAYC-S/N**
  - Crypto Key Loading Device/NATO

- **HSM**
  - Hardware Security Module
Encrypted Communication Systems

AVIYONIC CRYPTO

MİLSEC-3
SECURE VOICE DEVICE
FOR HF/VHF/UHF RADIOS

IFF – MOD 4/5 CRYPTO UNIT
IDENTIFICATION AND
RECOGNITION FRIEND OR FOE
Encrypted Communication Systems
Encrypted Communication Systems

DATA CRYPTO

SIR
Secure USB Storage Device

SIR-S
Secure Portable Harddisk

VERISAR
Portable Offline Crypto Device

SIR-D
Ruggedise Secure USB Storage Device

HVTC
CLASSIFIED DATA TRANSFER DEVICE

VERISAR
Portable Offline Crypto Device
Encrypted Communication Systems

**VOICE ENCRYPTION DEVICE**

- MILSEC-1A
- MILSEC-2
- MILSEC-3
- MILSEC-4

**SPECIAL PURPOSE CRYPTO DEVICE**

- IFF MOD 4
- IFF MOD 4/5
- KEMET DATA LINK

**DATA ENCRYPTION DEVICE**

- MILON 1
- MILON 2
- MILON 3
- SVKC
- MILON 4C
- MILON 5-6-7
## Encrypted Communication Systems

### IP Crypto Devices
- **IPKC-E**
- **IPKC-EG • IPKC-G**
- **IPKC-T**
- **IPKC-G2**

![IP Crypto Devices](image1)

### Network Security Devices
- **AGC-100T**
- **AGC-G**
- **AGC-T**

![Network Security Devices](image2)
Quantum Technologies
Quantum Technologies

QUANTUM RNG
QUANTUM BASED RANDOM NUMBER GENERATOR

SQUARE Projesi: Silicon Photonics for Quantum Fibre Networks 2018-2021

European Telecommunications Standards Institute
ISG QKD Workgroup Vice Chair
(PKI)
Electronic Certificate Management Infrastructure
Smart Card Systems
(PKI) Public Key Infrastructure

PUBLIC KEY INFRASTRUCTURE
DESKTOP CLIENT

ELECTRONIC SIGNATURE

ESYA SM
CERTIFICATION AUTHORITY
ESYA API
ELECTRONIC SIGNATURE LIBRARIES

ESYA ZD SERVER
ESYA TIMESTAMP SERVER

İMZAGER
IMPLEMENTATION OF
DESKTOP SIGNING

SECURE PDF
PDF SIGNING / ENCRYPTION
APPLICATION
Smart Card and ID Verification Systems

AKİS e-PASSPORT
ELECTRONIC PASSPORT

AKİS e-DRIVER LICENSE
ELECTRONIC DRIVER LICENSE

AKİS BİLET
e-TICKETING&PAYMENT APPLICATIONS

e-ID
ELECTRONIC IDENTITY CARD

KYS
CARD MANAGEMENT SYSTEM

KEC
CARD ACCESS DEVICE

EKDS
ELECTRONIC AUTHENTICATION SYSTEM
Data Valorisation
Data Valorisation

İYON SUITE
FORENSIC IMAGE ENHANCEMENT & RESTORATION SOFTWARE

Focus Blur Removal

Noise Reduction

Improvement / Dark Image Correction

DerinGÖRÜ
Face Recognition and Smart Turnstile System

SKAAS
Digital Storage Archive and Analysis System
Data Valorisation

NATO ARCADE & SMIR-ONLINE
ALLIED RADIO FREQUENCY COMPUTER AIDED DATA EXCHANGE & SPECTRUM MANAGEMENT INFORMATION REPOSITORY ONLINE

UASİS
National Land Cover Classification and Monitoring System

VISKON-RS
Rapid Damage Assessment Software with Remote Sensing
Electronic Intelligence
Electronic Intelligence

FD300A
IF CONVERTER

SGS 4.0
SPECTRUM MONITORING SYSTEM

YTA-018D
SOFTWARE-BASED
WIDEBAND RECEIVER

FDC101
BROADBAND ELINT
FREQUENCY CONVERTER

FDC201
BROADBAND FREQUENCY EXTENDER
Aviation Technologies
Radar Technologies

- MGR PSR RADAR
- KUŞRAD AVIAN RADAR
- FODRAD FOD DETECTION SYSTEM
Radar Technologies

- **MSGS**
  MOBILE COASTAL SURVEILLANCE SYSTEM

- **PYAS**
  PASSIVE BROADCAST DETECTION SYSTEM
Intelligent Transportation Technologies
Intelligent Transportation Technologies

DAS
RAILWAY INTERLOCKING SYSTEM

DTKM
RAILWAY TRAFFIC CONTROL CENTER

CBTC
NATIONAL SIGNALIZATION SYSTEM
Bioelectronic Devices and Systems
Bioelectronic Devices and Systems

- Electrochemical Based Desktop Diagnostic Device
- Hand-Held Warfare Agent Biosensor Diagnosis Device
- Transcutaneous Bilirubin Measurement Device
- CBRN Vehicle
- Hand-Held Warfare Agent Biosensor Diagnosis Device
- CBRN Vehicle
Bioelectronic Devices and Systems
Bioelectronic Devices and Systems

FORENSIC XP-4010D
NEXT GENERATION QUESTIONED DOCUMENTS EXAMINATION

UMKC
NATIONAL MARKER CONTROL SYSTEM

UMKC
OPET NATIONAL MARKER CONTROL SYSTEM
Electro-Optics & Laser Systems
Electro-Optics & Laser Systems

BİLGEM PHOTODEEJECTOR SOLUTIONS (GUIDED MISSILES)

- CİRİT
  Laser Guided Missile

- Seeker Head

- L-UMTAS
  Laser Guided Long Range Anti-Tank Missile System

- Seeker Head

- DDA-1
Electro-Optics & Laser Systems

BİLGEM PHOTODEECTCTOR SOLUTIONS (GUIDED MUNITIONS)

TEBER
Laser Guidance Kit

MAM-L
Mini Smart Munition

DDA-2
Seeker Head

Seeker Head

DDA-1
Electro-Optics & Laser Systems

- **ARMOL**
  Vehicle Mounted Laser

- **TÜMOL**
  Rifle Mounted Laser System

- **YGLS**
  High Power Laser

- **IED DEFUSION**

- **WIRE CUTTING**

- **DRONE STRIKING**
Cyber Security
Cyber Security

STAMPS
CENTRALIZED CYBER THREAT SENSOR SYSTEM

Real-Time Attack Monitoring

SGEP
CYBER SECURITY TRAINING PORTAL

ZYAL
MALWARE ANALYSIS LABORATORY

CYBER SECURITY GUIDES
Cyber Security

VKÖS
DATA LEAKAGE PREVENTION SYSTEM

CS ANALYZES
DEVELOPMENT OF SECURE SOFTWARE
PENETRATION TESTS
INFORMATION SECURITY MANAGEMENT SYSTEM
RISK ANALYSIS
MALWARE ANALYSIS

SİBERMEYDAN CTF
CYBER SECURITY SIMULATION
AND COMPETITION ENVIRONMENT

SORT
CYBER SPACE TRAP SYSTEM
Command Control and Naval Systems
## Command Control Systems

### MÜREN
SUBMARINE COMBAT MANAGEMENT SYSTEMS

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<td>1 Ground Stationed System + 2 Submarine System</td>
<td>1 Ground Stationed System + 4 Submarine System</td>
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Naval Systems

DRT TABLE
DIGITAL DEAD RECKONING TABLE

SATEL
UNDERWATER TELEPHONE

SHIPBOARD D/G
SHIPBOARD AUTOMATIC DEGAUSSING SYSTEM

DABİS
SUBMARINE BATTERY MONITORING SYSTEM

GEZKİY
REAL-TIME IR TRACK PREDICTION AND MANAGEMENT SYSTEM
Electronic Warfare Technologies
Electronic Warfare Technologies

REDAY
RADAR AND ELECTRONIC SUPPORT SYSTEMS
PERFORMANCE ANALYSIS SOFTWARE

SIMA
SIMULATION MODELLING INFRASTRUCTURE

E-HARP
ANALYSIS, TEST & EVALUATION AND ENGINEERING SUPPORT SERVICES

INFRARED MEASUREMENTS
DATA BASE MANAGEMENT AND ANALYSIS SOFTWARE

MANAGEMENT AND ANALYSIS OF RADIO SPECTRUM SYSTEM

GEZKİY
REAL-TIME IR TRACK PREDICTION AND MANAGEMENT SYSTEM
Electronic Warfare Technologies

F16 - EH POD
ELECTRONIC WARFARE POD

F16 - ED POD
TACTICAL ELECTRONIC WARFARE
SUPPORT & MANAGEMENT POD
Telecommunication and IT
Telecommunication

SRC155A
DIGITAL RADIO DEVICE

3G

SRC400
NEW GENERATION HIGH SPEED
DIGITAL RADIO LINK DEVICE

4G

5G
Information Technologies

**BIG DATA ANALYSIS SOLUTIONS**

**MINISTRY OF NATIONAL EDUCATION-TEOG DATA ANALYSIS**

**PENDIK MUNICIPALITY – CALL RECORDS ANALYSIS**

**BORSA İSTANBUL**: Big Data Infrastructure and Analysis Project
Information Technologies

BAĞ
Blockchain Infrastructure Research

BİGA
GOLD Based Digital Asset Platform

CYBERRANGE
Simulation and Trainings
Simulation and Trainings

atcTRsim
AIR TRAFFIC CONTROL TOWER AND RADAR SIMULATOR

DATAS
SUBMARINE TACTICAL SIMULATOR

TAKSİş
TACTICAL TRAINING SYSTEM

TRENSİM
E 43000 LOCOMOTIVE SIMULATOR
E-Government
SOFTWARE DEVELOPMENT

GOVERNMENT ACCOUNTING INFORMATION SYSTEM
An electronic document-based information system which enables centralized management of the accounting transactions of all public institutes and agencies is being developed in cooperation with Minister of Treasury and Finance through significantly simplified and speed up processes.

Start and End: October 2016 - October 2019

“The State Accounting Information System that developed by Open Source Code Software Technologies, is working on an open source code database.”

PRODUCT TRACKING SYSTEM
National Product Tracking and Monitoring Model and compatible information system are being developed in order to provide infrastructures for tracking medical devices and cosmetic products from end-to-end, conducting audit mechanisms and executing clinical engineering processes in a reliable and effective manner.

Start and End: January 2014 – December 2018

“ÜTS is the information system that has been put into practice for the first time in the world in order to ensure the tracking of all produced or imported medical devices in Turkey.”

- SIMPLE AND FAST ACCOUNTING
- ONLINE REALIZATION OF PUBLIC PAYMENTS
- EFFECTIVE PROACTIVE BUDGET CONTROL
- ADMINISTRATIVE BASED ACCOUNTABILITY
- E-DOCUMENT STANDARD IN FINANCIAL DATA SHARING
- RELIABLE PRODUCT ACCESS
- DETERMINATION OF HEALTH POLICIES
- EFFICIENT AUDIT
- STRUGGLE AGAINST UNRECORDED ECONOMY

- 226 Public Administration
- 35 Million Annual Accounting Process
- 20 Integration with System
- ~140 Thousand Registered Cosmetic Products
- >3,2 Million Registered Medical Devices
- >40 Thousand Registered Companies
- 645 Billion TL Annual Accounting Transaction Amount
- 3 Billion TL Daily Average Payment
- 1 Billion TL Daily Average Collection
- 550 Thousand Movement Notification
- 250 Thousand Unique Product Record
- 8 Million Transaction
DIGITAL MASTERY MODEL
Digital Maturity Model that specified to evaluate the digital maturity of public institutions and their services has been developed in public institutions and short, medium and long-term solution proposals have been presented to improve the maturity of the institutions. Guidelines have been prepared for use as guidance in areas of competence compatible with the maturity model.

DIGITAL COMPETENCE MODEL
Digital Competence Model has been aimed to define the strengths and weaknesses of IT experts who are working in public institutions by evaluating the competency and to identify open areas for improvement in terms of training and career development.

NATIONAL SMART CITIES STRATEGY AND ACTION PLAN
Under the policy ownership of Ministry of Environment and Urbanization, Turkey’s first national Smart City Strategy and Action Plan covering the years 2019-2022 is being prepared by the common wisdom of ecosystem stakeholder, taking into account national needs and priorities as a whole based on the Turkey-specific Smart City Maturity Model.

Start and End: March 2018 - January 2020

28 Roles
41 Competences
5 Levels
~700 Expert Appraisals

“Digital Maturity Model Specified for Turkey was developed.”

“It is the 4th strategy and 3rd action plan prepared at the national level in the world in the smart city transformation.”

“2016-2019 ULUSAL AKILLI KENTLER STRATEJISİ VE EYLEM PLANI”

MEVCUT DURUM ANALİZİ RAPORU
İZLEME VE DEĞERLENDİRME MODELİ VE SİSTEMİ
OLGUNLUK DEĞERLENDİRME MODELİ
AKILLI KENTLER PORTALI (www.akillikent.gov.tr)
Digital transformation needs identified by the public institutions and organizations in order to make the best use of information technologies are defined with a multidisciplinary institutional architectural perspective and solutions are taken considering new technologies and innovative approaches.

Basin monitoring and carbon tracking models have been developed with the use of geographical information.

Turkey aims to determine the National Geographic Information System to improve the way geographical data to meet the needs of all users and institutions on a common infrastructure, content and geographical data exchange standards.
Testing, Evaluation and Laboratory Services
Testing, Evaluation and Laboratory Services

OKTEM
COMMON CRITERIA TEST LABORATORY

RAPSİM
RADAR PERFORMANCE AND SIGNATURE ANALYSIS LABORATORY

EMI / EMC TEST AND EVALUATION LABORATORY

YTKDL
SOFTWARE TEST AND QUALITY MANAGEMENT LABORATORY

COMSEC LABORATORY

KAL
CRYPTO ANALYSIS LABORATORY

TEMPEST TEMPEST TEST LABORATORY
Testing, Evaluation and Laboratory Services

YİTAL
SEMICONDUCTOR TECHNOLOGIES
RESEARCH LABORATORY

TÜTEL
INTEGRATED CIRCUIT DESIGN
AND TRAINING LABORATORY
Thanks

www.bilgem.tubitak.gov.tr

2019