STRATEGIC IT REPORT ON NATION WIDE EDUCATIONAL PROJECT

MONE-TURKEY

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# LIST OF ABBREVIATIONS

1. **FATIH**  Increasing the Opportunities and Improving Technology Movement (Firsatlari Arttirma Teknolojiyi İyilestirme Hareketi)
2. **EBA** Egitim Bilisim Agi (Education Informatics Network)
3. **OBA**  Ogretmen Bilisim Agi (Teacher Informatics Network)
4. **MoNE** Ministry of National Education (Milli Egitim Bakanligi)
5. **ICT** Information and Computer Technologies
6. **IT** Information Technologies
7. **IS** Information Strategy
8. **ICT4ED** Information and Computer Technologies for Education

# 

# INTRODUCTION

In this study, The Fatih Project which was launched by the Turkish Ministry of Education in 2011; its execution, effects on the institution, and project outcomes have been evaluated. After overall undertaking all steps of the project, a future IS suggestion has also been made.

I have worked as a computer science teacher for more than ten years in schools affiliated with the Ministry of National Education, and, because I had the opportunity to look at the process both as an expert and a stakeholder from the beginning of the project, I have included my personal opinions and observations in this study. I have added necessary parts to my work by utilizing publicly available sources, news articles in written media, academic studies conducted nationally and internationally, parliamentary written questions, activity reports and strategic plans of the ministry, and finally, data and statistics from the official websites of the project and its components along with institutional official websites. As well as past scholarly studies on the project, official figures and publications from the ministry and other government organizations were consulted during the study. Translations from English to Turkish were done where necessary, and the translated sources were cited.

Being a stakeholder of such a wide national ICT4ED project and personally observing its positive and negative effects has greatly benefited my professional career and development. Thanks to this coursework, I am happy to be able to talk about both the project and my personal experience.

# BACKGROUND OF THE ESTABLISHMENT

Milli Egitim Bakanligi (MEB) is the ministry of national education (MoNE) that is responsible for delivering and monitoring formal education and training at a large-scale including preschool to lifelong learning in Turkey.

The ministry dates back to the Ottoman Empire. As a consequence of Mahmud II's reforms in the Ottoman Empire in the 19th century, education became the responsibility of the state. These regulations divided education into three main categories, similar to today's approach, and a ministry started controlling education. Throughout history, it has been known by different names and structures according to various legal changes and regulations, and its modern version was formed by Law 652 in 2011. (MoNE, 2023)

MEB has centralised and expertise bodies, provincial directors in every city in Turkey, and overseas organisations as follows: (MoNE, 2023)

Diagram

Description automatically generated

Figure 1. Organisational Hierarchy of MoNE- (Beycioglu, K. et al, 2014)

According to statistics published by MoNE for the period 2021-2022, it is stated that 19,155,571 students are enrolled in preschool, primary and secondary schools, with the majority of them registered in secondary schools, and 1,139,673 teachers worked at 70,383 schools with 749,454 classrooms during the academic term. (MoNE National Education Statistics, 2022)

Digital transformation and auditing processes are handled by the Directorate General of Innovation and Educational Technologies (YEGITEK) in MoNE. In addition to managing the actions supporting technology, YEGITEK conducts studies into the use of IT and its products in education and training, following, and evaluating new technologies and advancements, ensuring that everyone in the education system is able to benefit from them. (MoNE YEGITEK, 2023)

The FATIH Project which is evaluated in this study has also been proceeded by this department of the ministry.

# BRIEF SYSTEM BACKGROUND OF MoNE

MoNE’s technological system is mostly based on an online and large scaled structure. The ministry's services are delivered to the users more promptly and effectively by using modern technological means. In this context, the Ministry of National Education Information Processing System (MEBBIS), which has a modular design, is used for the majority of institutional and individual works and transactions. The system continuously holds data about staff and students.

Organisational activities, official correspondences among either bodies or staff, personnel affairs, student affairs, document management systems, and even inventory processes are handled online via the MEBBIS platform which has several modules and allows everyone around the system to carry out their process on the web or mobile based applications. Accessibility to those modules of MEBBIS systems varies on rank, authority, and role. To illustrate this, all stakeholders including parents have access to one of the modules of this online system, e-Okul (e-school), in order to get information about their children’s progress, marks, and attendance. On the other hand, teachers and managers can also sign into this module for the use of evaluation and consultancy.  All elements of the MEBBIS information system are compatible with signing in via an e-government platform of Turkey, as known as e-Turkiye. (MoNE Activity Report, 2021)

Additionally, various internet services are provided for school buildings where it is applicable. Besides, classrooms are surrounded by an interactive system with smartboards as well as providing a tablet PC for each member of a school such as teachers, managers, students, etc. as the outcomes of the FATIH project, which will also be discussed in further sections of this report thoroughly.

# FATIH PROJECT

FATIH project is an initiative by MoNE which is named after Emperor Fatih II conqueror of Istanbul, and also an abbreviation for Increasing the Opportunities and Improving Technology Movement (Fırsatları Arttırma Teknolojiyi İyileştirme Hareketi in Turkish).  It aims to provide equal opportunities for individuals and institutions in the education system to effectively use computer and information technologies aligning with national education objectives. It offers students better learning opportunities and prepares them for the digital age's needs. (MoNE FATIH Project, 2023)

The scope of this project is to offer hardware and software for classrooms and individuals, develop e-content and platforms, design in-service training for educators, ensure the effective use of ICT in curricula and provide measurable and manageable ICT usage.

The FATIH project started in 2010 and was initially aimed to be completed in 2015. However, as the project progressed, its scope was expanded, and the project completion date was extended until the end of 2023. The amount spent on the project so far is £170 million. By the end of 2023, a total of £350 million is expected to be spent. (Mrs. Karabiyik, 2021)

## MILESTONES

The hardware supply of the project has been implemented in three stages. In the first stage, hardware was provided for colleges, in the second stage for vocational high schools, and in the third stage, hardware and internet infrastructure were established for institutions at the preschool and elementary school levels. During this process, the internet infrastructure of schools was renewed, high-speed connections were provided, smart board installations were made for classrooms, and tablet computers were distributed to students and teachers in these schools.

In-service education for teachers has begun in schools where the installation has been completed. During the education for teachers, topics such as how to use interactive boards and the EBA platform (which started to be used with the FATIH project) how teachers can develop content to be used on smart boards, and safe and proper internet usage were covered. In addition, it was explained how the tablet PCs given to the students will be managed by the teachers.

## OBA

OBA is a teacher information network and is used to provide in-service training and life-long learning activities for teachers of MoNE, and it has been developed in the scope of the FATIH project. On this platform, teachers can access a wide range of content allowing them to improve their skills and abilities. (MoNE OBA, 2023)

## EBA

The Education Informatics Network (EBA) is a free online social education accessible to all individual’s platform provided by The Directorate General of Innovation and Education Technologies. EBA is available for use all the time. The purpose of this platform is to assist in the effective utilization of materials through information technologies and promote the integration of technology into education.

EBA is the main online platform for FATIH project. It offers an extensive range of educational resources, including over 1,700 curriculum-based courses and more than 40,000 interactive content items including coursebooks, applications, tests, interactive courses, revision summaries, infographics, project documents, and teacher-specific content. In addition to over 5,000 books and 240,000 questions, the library section on EBA provides leisure content on several subjects such as cartoons, reading books, games, documentaries, and magazines. (MoNE EBA, 2023)

Furthermore, the EBA platform offers personalized revision content using its smart suggestion system. It is a social education platform enabling students and teachers to communicate with one another by creating profiles, messaging, and discussions. Teachers can create assignments and analyse their students' assignment-specific and subject-specific performance (MoNE FATIH Project, 2023)

# IMPLEMENTATION OF THE PROJECT

The project was initially planned for 5 years, and implementation started in 2011. The following implementations were carried out in the first five-year period:

154 pilot schools and 3,362 schools were equipped with local area connection and internet infrastructure in phase 1 of the project, totalling to 3,516 schools. Interactive whiteboards were installed in 84,921 classrooms and 3,657 multifunctional printers were distributed to these schools. In 2013, 62,800 tablet PCs were given to teachers and students. By 2014, the number of interactive whiteboards increased to 114,921 and 20,269 multifunctional printers were provided. The number of tablet PCs distributed to teachers and students rose to 737,800. Additionally, 10,600 tablet PCs were planned to be distributed and the process is still ongoing as of the MoNE Activity Report in 2015.

During the 2nd and 3rd phases of infrastructure and hardware work, tenders were completed for 347,367 interactive whiteboards, 13,645 A3 multifunctional printers, and 28,351 A4 multifunctional printers for vocational schools and primary schools in districts and villages. Delivery and installation began and by the end of 2014, 101,644 interactive whiteboards were delivered. By the end of 2015, it was planned that 25,384 multifunctional printers would be delivered and installed. As of February 21, 2015, 4,000 schools without high-speed internet were provided internet through satellite, while 35,684 schools were provided with ADSL connections.

It was planned that all schools would have fiber internet connection by the first quarter of 2015. The geographical decision support system, which allows schools to update their institutional and contact information, was completed for 54,000 schools, including the hardware information for 154 pilot schools and 3,657 schools in Phase 1.

Initially planned to be implemented in pilot regions, this project later became mandatory for all colleges and vocational high schools, and hardware and infrastructure works, and building renovations continued until 2020 in all such schools. In addition, the development of the project's platforms gained momentum.

During the pandemic, 500,000 tablet PCs were distributed for students and schools in areas that still do not have access to technology and the internet, and computer laboratories in schools with suitable infrastructure were transformed into EBA Support Points for students to participate in distance learning activities. (MoNE Activity Report, 2021)

State television channels have also started broadcasting 24-hour remote education programs (EBA TV) for all educational levels within the scope of the FATIH project to support remote education during the pandemic. (MoNE EBA, 2023)

# THE STRATEGIC IMPACT OF THE PROJECT

It is clear that such a large national project has many positive and negative effects. In this section, both sides have been evaluated.

By the development of a national education network that connects schools and gives access to educational materials for all students and instructors, the project has conserved the centralization and standardization of Turkey's educational system. Moreover, a structure that adapts to change has been adopted which is the most crucial impact of this project. During the pandemic, most of the students and teachers continued their education using the familiar interface they were already acquainted with.

Due to the familiarity of the new generation with technology, the use of digital content and activities in lessons has made it easier for students to participate in classes and for the teachers to give their lessons. This includes using educational software, digital textbooks, online quizzes, and other forms of interactive media to supplement traditional classroom learning. This implementation has changed the way of traditional teaching.

Speaking of the economic impact of the implementation, the digital content market has developed. Publishing houses and other stakeholders in the market have started producing digital content, which includes various types of media such as e-books, articles, videos, and more. In addition to this, the need for maintenance and supply has created a new market. The maintenance service market for smart boards and tablets has expanded. New actors have emerged in the market.

As opposed to growth in the market, as market players were enjoying their share, students in rural areas or from disadvantageous areas preferred to sell their tablet PCs in order to earn more income.

Educational processes and teacher activity have become monitored through the EBA platform. This reduced the workload of supervision. On the contrary to this, some teachers have used these instruments to show so-called extra performance to their supervisors for the sake of favoritism.

The inability to intervene immediately in software and hardware errors greatly hindered the adaptation of teachers and students to the process. Difficulties were experienced in the adaptation of teachers with different backgrounds to the new system. (Ciftci et al., 2013) Especially the inability to find content suitable for every subject decreased the motivation of teachers. Elderly teachers showed resistance to adapting to the new system. (Gok A. and Yildirim Z., 2015)

Anxiety disorders and unwanted behaviors developed due to excessive information. (e-okul information system messages) An automated information system without the supervision of the guidance service had a negative impact on children's development. Plus, the natural stakeholders of the system, parents, were not adequately informed about the process, leading to unconscious use of the system and devices. (Coruk A. and Tutkun T., 2018)

As a result of computer science teachers having to take on these tasks instead of employing technical personnel in schools, teachers were unable to achieve professional satisfaction, and the out-of-scope demands of school management and senior executives became a problem. This led to mobbing.

Legal issues emerged between parties due to the unclear terms in contracts, internet service providers failed to provide the promised service, resulting in schools not paying their bills as per the ministry's instructions. Teachers who wanted to use smart boards in classrooms where the internet was not available had to use their own 3G connections for a long time. All parties suffered from the situation.

The tablets distributed had compatibility issues, update problems, and access and authorization issues, so they could not be used properly for their intended purpose.

During the pandemic, students in rural areas with infrastructure deficiencies were left without education because of the lack of infrastructure and networking.

The failure to complete the project within the promised time frame and budget caused a lack of trust in the public.

# POST-IMPLEMENTATION REVIEW

This project, which had many admirable goals at the outset and was expected to be completed in 2015, is still unfinished. According to the responses given by the Ministry of National Education to questions raised in the Turkish parliament, the project will be completed in 2023 and will cost a total of 8 billion Turkish liras. However, both the written press and public opinion do not share the same view. Most people believe that corruption has taken place and that the public has been harmed.

The FATIH project could not go beyond providing hardware. The infrastructure and system that were established may have served largely during the pandemic period. However, it worked only in large cities and areas where the system functioned properly. In rural areas and regions without internet infrastructure, students were deprived of education for a long time. Distance learning had to be provided through state television channels as well. This situation reveals a contradiction with the principle of increasing opportunities that this project was supposed to align with.

On the other hand, the quick reactions of many stakeholders in the National Education system to sudden situations by using online platforms have also strengthened the system. In-service trainings, which were previously conducted face-to-face, have become continuous and online. New approaches were easily adopted.

One of the shortcomings of the project is that many stakeholders still have not received the tablet PCs that were promised to be provided to every teacher and student under the project. Additionally, even those teachers and students who received tablets could not use them for educational purposes. (Isci T., and Demir S., 2015)

During the pandemic process, it was revealed that many students still did not have access to the internet and computer devices. In response, the ministry expanded the scope of the project and distributed an additional 500,000 tablets. However, this initiative was perceived by the public as opening the door to new contracts and corruption.

The fact that the system is supported by online platforms is important in terms of collecting data. However, it is quite difficult to decide how effective and useful the system is just by looking at numerical data. As mentioned before, it is also important to consider the fact that teachers may give students too many assignments and the quality of education may not be reflected in the data.

The fact that the system is supported by online platforms is important in terms of collecting data. However, it is quite difficult to decide how effective and useful the system is just by looking at numerical data. As mentioned before, it is also important to consider the fact that teachers may give students too many assignments and make unnecessary posts on the system, which can hinder the system from making objective and accurate measurements.

Due to the highest allocation of resources in the project being devoted to hardware, sufficient time and budget could not be allocated for teacher training. (Yavuzalp et al., 2015) This led to teachers using the system in an unskilled way. Integrating the computer system into classrooms alone does not necessarily mean that computer systems are being used effectively. (Kurtoglu et al., 2012)

In spite of the project's goal of ensuring equal opportunities, the planning stage did not adequately take into account the logistical challenges involved in ensuring fair and timely distribution of resources, which led to a significant issue before the project was even executed. The project's ultimate goal of offering equal chances became compromised as a result. It was determined that the early phase of such national programs demands thorough planning, as well as participation and collaboration from stakeholders including educators, researchers, and even students themselves. (Kizilet E and Ozmen S., 2017) It was crucial to get opinions from a range of viewpoints in order to make sure that the project's objectives match the needs and expectations of the people. The chance of a project being implemented successfully may also be increased by such collaboration, which can assist in identifying possible logistical issues and facilitating the creation of efficient solutions to address them.

The majority of teachers and students enjoy the lessons that integrate technology and believe that the system is useful. However, this is not applicable to some lessons and may vary depending on the computer skills and faith of the teachers in the system. As mentioned in Coruk's study, some teachers do not believe that the project actively involves teachers and students in the education process (CORUK, A). However, administrators and computer teachers do not share the same opinion. Administrators want the in-service training under the FATIH project to be longer and technical personnel to be employed in schools to address the issues that arise. Otherwise, computer teachers are forced to perform these tasks because their roles in this project are not clearly defined. (Akkoyunlu B.and Baskan B., 2014)

# A PROPOSITION FOR THE FUTURE IS STRATEGY

According to the strategic plan 2019-2023 of MoNE, it has been highlighted that the lack of a data-driven decision-making mechanism is one of the major weaknesses of the ministry. (MoNE, Strategic Plan 2019-2023) The FATIH project and many digital applications of the ministry have made it mandatory to manage and process big data. In addition, efforts to reduce the workload caused by bureaucracy for school administrators and teachers will facilitate educators' focus on their main tasks.

AI technologies have started to be used in the education sector, just like in every other field. The implementation of applications that automate educational management and support data mining, such as learning analytics, can greatly reduce workload (Villanueva, 2003). In addition, student problems that may arise from possible risks can also be minimized (du Boulay et al., 2018). The e-school module in the current online MEBBIS system is an educational management system. Data mining can be used for both decision-making and warning processes with AI applications to be included in this system. The data obtained from data mining can play a role in determining future strategies (James et al., 2008; Marsh et al., 2006).

Chatbots are computer programs that can communicate with humans by utilizing cloud-based services and AI technology. They are designed to respond to inquiries or commands from users by providing information or completing simple tasks (Muniasamy A. and Alasiry A., 2020). Routine school processes such as frequently asked questions, enrolment, and attendance should be handled by educational chatbots to reduce the workload. Chatbots like Ada (Ada, 2023) and Deakin Genie (Deakin, 2023) can be easily integrated into educational institutions. Students, parents, school management, or teachers will not be bothered with such procedures and can complete their transactions through multiple devices or channels (Omnichannel).

In the near future, due to the inequity in accessing educational resources and personal differences, an AI teaching assistance system can be implemented in the national education system. Squirrel AI (SquirrelAI, 2023) learning platform is an AI-powered, K-12 adaptive, instructional system and services that enable students to learn at their preference and pace. This can be used as an assistant for human teachers or as a substitution if it is preferred.

A study carried out in China shows that a 13-year-old student struggling in Math increased his marks from 50% to 62% with the help of Squirrel AI at the end of the semester. Two years later he performed 85% on his final exam. (Hao, 2019)

An impressive solution that may help Turkey's unequal access to educational resources and individualized learning is the Squirrel AI learning platform. Turkey has a vast population and a range of economic circumstances, thus not every student has access to the same degree of education. This problem might be solved by implementing an AI teaching support system like Squirrel AI.

# CONCLUSION

In this study, the FATIH project, which is being carried out by the Turkish Ministry of National Education, has been evaluated. The strengths and weaknesses in the implementation were discussed, and suggestions were given to shed light on the future Information Strategy.

According to studies and recent statistics, the project has a good impact on the adaptation of emerging technologies into education. On the other hand, some points of the projects are far beyond understanding the main reasons for this implementation. After a point, it became a project focused on meeting hardware and infrastructure costs, causing teacher training and other variables to be ignored. All stakeholders including parents should have also been included before the project started, and a transparent, inclusive methodology should have been adopted to eliminate negative public opinion.

Information technologies within the Ministry and the big data obtained from them will play a role in determining future strategies and reducing the current workload. The world of education incorporates AI technologies into decision-making processes, solving routine tasks, and even the education process itself. MoNE should definitely include taking such steps in its future strategies.

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