



# Tel Aviv Stock Exchange takes control of risk

Customer success story



“We chose to keep Adabas & Natural in our move to Linux because we wanted to keep the 20–30 years of knowledge that resided on the back-end system. We will continue using Adabas & Natural as we see a good connection between new features—including DevOps and cloud—and the new world.”

– Hezi Shirazi | System Architecture Back Office, TASE



### Customer Profile

The Tel Aviv Stock Exchange (TASE) provides investors with a reliable and comprehensive trading platform for a wide range of securities and financial instruments including shares, bonds, Treasury bills, ETFs, options and futures for equity indices, options and futures of foreign currency exchange rates.

### New challenges

- Stay at the forefront of technology in order to reduce risk, improve capabilities and achieve non-stop operations
- Retain knowledge and critical Natural application development of 20–30 years on back-end systems
- Implement DevOps to give developers more speed and agility

### Software AG solutions

- NaturalONE—Eclipse®-based IDE
- Adabas on Linux, Natural on Linux

### Key benefits

- Reduces costs and minimized risks
- The advantages of a tailor-made, mission-critical application
- Complies with international standards, security and regulations
- Ability to develop in other languages and models
- Improves version management
- More developers can work with trading system platform

## Embracing the new, leveraging the old

The Tel Aviv Stock Exchange (TASE), the only exchange in Israel, understands competition. It competes for market share with digital-first fintech firms as well as some of the biggest, most powerful exchanges in the world. And, as Israel is the second-largest home of high-tech startups (next to Silicon Valley), TASE also must compete for IPOs. To do this, the exchange had to modernize its technology.

TASE needed to be able to offer digital services on par with new FinTech firms, while adhering to local and global regulations. It also needed to provide services that compete with the larger first-tier exchanges like Nasdaq®, LSE and NYSE.

Its first project was to move its clearing and settlement system based on Adabas & Natural to Linux, where its trading system resides. The Linux operating system is less expensive to operate and maintain and, as an open source platform, provides TASE with a wider selection of development and versioning tools.

With the help of Software AG, TASE seamlessly rehosted more than 10,000 Natural programs and Adabas databases that processed more than 300,000 clearing and settlement transactions per day from its legacy environment to Linux. This move reduced costs and minimized risks while keeping the advantages of its tailor-made, mission-critical applications and back-end data.

## DevOps for all

For the next phase, TASE wanted to bring all its programmers together under one DevOps-based architecture. Software AG's Eclipse-based development environment, NaturalONE, integrated easily with the DevOps environment already being used by TASE's Java®, C++ and Python® programmers.

Now development of new applications and enhancements to existing applications is guided by the same DevOps standards and procedures regardless of programming language or models.

The move to NaturalONE and DevOps also ensured programmers had access to the latest state-of-the-art tools for agile development and deployment. For example, the ability to control the development environment with open source version control systems like Git is proving invaluable to meeting regulatory requirements.

Regulatory requirements—local and global—meant that TASE needed versioning control for critical systems. TASE produces indexes where the calculations change continually, depending upon new securities and payment events. Version control is paramount so that regulators can see what changes were made and when.

Improved version management means it requires less effort for programmers, with more control of changes and quicker, more agile development.

Prior to the introduction of NaturalONE, programmers did not have access to any easy tools to merge and evaluate changes made when different programmers worked on the same piece of code.

Relying on manual scans to identify applicable changes was time-consuming and risky.

"We needed source control to develop more security—and to see the history of who modified what and when. Introducing NaturalONE allowed us to conform to DevOps standards and procedures and control our development environment while starting to improve the productivity of our programmers. We still have a long way until we exploit this new area but we are moving forward."

— Hezi Shirazi | System Architecture Back Office, TASE

With the introduction of NaturalONE, TASE is already seeing improved programmer productivity. Developers can now use the Git repository-based version control system and allow merging of duplicate changes if several developers work on the same source code. This is easy to do by comparing the two versions on one screen and approving each required change.

Version control with NaturalONE is very powerful—since all versions of the source code are kept in the repository, changes can go forward or be rolled back. The security of being able to reactivate older source code reduces risks and improves developer productivity.

## What's next?

With all of its applications and data now on Linux, TASE's next step will be to implement a cloud architecture—by using virtualization to separate the database server from the application server. This will ensure better control of each server by not being dependent on one physical machine. "We want to ensure better business continuity and security and more high availability in an architecture that allows the application and database to run on different servers," said Hezi Shirazi of the System Architecture Back Office.

TASE plans to use virtualization—a technique that splits the Natural application into services that can run on Docker® containers—to separate the data from the application and placed each on different servers. With load balancing, TASE will be prepared to handle system outages with quicker and easier recovery—ensuring business continuity if a server ever goes down.

## Open systems, open minds

When TASE rehosted its Adabas & Natural application to open source Linux, its Natural developers were initially reluctant to start working in the new Eclipse-based environment of NaturalONE now available to them. Wary about using modern tools, the TASE programmers needed convincing.

Software AG provided on-site training and mentoring for NaturalONE. Within just a few days of showing the advantages of how NaturalONE could work in the integrated DevOps environment, the programmers' reluctance dissipated.

"After seeing all the bells and whistles of using NaturalONE with DevOps tools like Git and Jira®, the developers were astounded at how much easier it would be for them to develop better program code, faster and more securely," noted Ilan Hirschowitz, the Software AG Solutions Engineer who led on-site workshops.

And, there was an added bonus: The new development architecture brought all of TASE's development teams together. From clearing to derivatives, the various specialty teams and business stakeholders now all know each other, are working together and understand the importance of what each team—and the exchange—is doing.

TASE is now equipped to face the strongest competitors with agility and speed, thanks to a smart move to Linux and adoption of NaturalONE in an Eclipse-based DevOps environment.



**Take the next step**

To learn more, contact your Software AG representative or email us at:  
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[www.SoftwareAG.com/customers](http://www.SoftwareAG.com/customers)

## ABOUT SOFTWARE AG

Software AG began its journey in 1969, the year that technology helped put a man on the moon and the software industry was born. Today our infrastructure software makes a world of living connections possible. Every day, millions of lives around the world are connected by our technologies. A fluid flow of data fuels hybrid integration and the Industrial Internet of Things. By connecting applications on the ground and in cloud, businesses, governments and humanity can instantly see opportunities, make decisions and act immediately. Software AG connects the world to keep it living and thriving. For more information, visit [www.softwareag.com](http://www.softwareag.com).

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