Trends in Workstations

Fujitsu Evolves With The Times And Over Time

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Current trends in workstations, workstation customers and their challenges 4
Fujitsu's history in workstation domain 4
An overview of Fujitsu WS product line and markets served 6
Fujitsu workstations are used in all types of applications 8
Big pictures 8
VR views 9
See it before you build it 10
AI based digital microscopy 10
Make movies in less time 11
Trends in the workstation market 12
Future - continuation of Fujitsu's commitment to Europe. 13

Figure 1: Mobile workstation are gaining market share rapidly 4
Figure 2: Fujitsu's history in workstations since 1990 (Source Fujitsu) 5
Figure 3: The history of Fujitsu 6
Figure 4: A sample of Fujitsu's product line (Source Fujitsu) 7
Figure 5: Jeffery Martin has made the largest single photo of Prague ever made, rendered on a Fujitsu CELIUS R970 workstation (Source Jeffery Martin) 8
Figure 6: Juraj Hudák computes and renders 360 VR environments on a CELIUS M770 workstation (Source Juraj Hudák) 9
Figure 7: West Medica design their systems to be as small as possible for crowded laboratories (Source West Medica) 10
Figure 8: Gaku Nakatani credits the Fujitsu CELSIUS H workstation with shortening the animation time of Forest of the Piano by six months (Source Gaina) 12

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Current trends in workstations, workstation customers and their challenges

Workstations are solid, reliable, and powerful specialized computers used in mission-critical applications. Downtime is simply not acceptable, and Fujitsu's workstations have realized seven nines reliability, an accomplishment not many companies can claim. In addition, if something does go wrong Fujitsu is famous for fast action support.

The workstation market has been relatively stable considering all the changes and turmoil in the world, but even it has had to make some adjustments to meet the needs of the users and market conditions. Today the workstation market is moving in multiple directions, segmenting, specializing, and economizing.

Segmentation is being demonstrated by the introduction of powerful mobile workstation, remote virtual workstation, and a new low-cost systems for budget-minded users or users with lower performance demands. The market is shifting with increasing market share for mobile workstations.

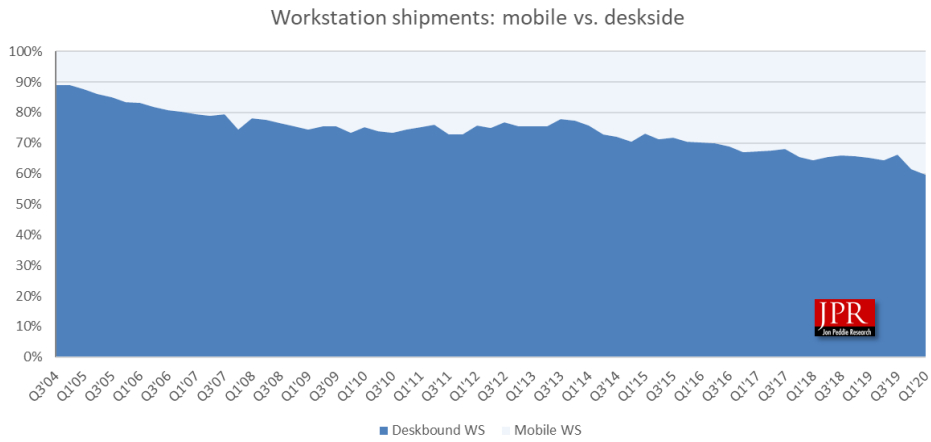

Figure 1: Mobile workstation are gaining market share rapidly

Several form factors have been tried, 13-inch, 15-inch, and 17-inch. The 13-inch models have been popular for size and weight, the 17-inch are seen as desktop replacements and considered luggable more than mobile, and the 15-inch have proven to be the most popular offering good size screen with 4K capability, powerful processors and surprisingly long battery-life.

Additional changes can be seen in the consolidation of the market and range of the products being offered by the workstation suppliers.

Fujitsu's history in workstation domain

The Fujitsu workstation group has a rich and long-standing history. It has developed powerful, reliable leading-edge systems for over 30 years.

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Fujitsu and Siemens began in 1923. In 1990 Siemens and Nixdorf formed Siemens Nixdorf Computers AG. Siemens Nixdorf started its workstation business in 1991. Those workstations were based on MIPS and UNIX.

In early 1995, the company started the development of the CELSIUS 1. With that system the workstation market moved from RISC UNIX to Intel/ Windows NT. Siemens was the first to announce an Intel / Windows NT workstation.

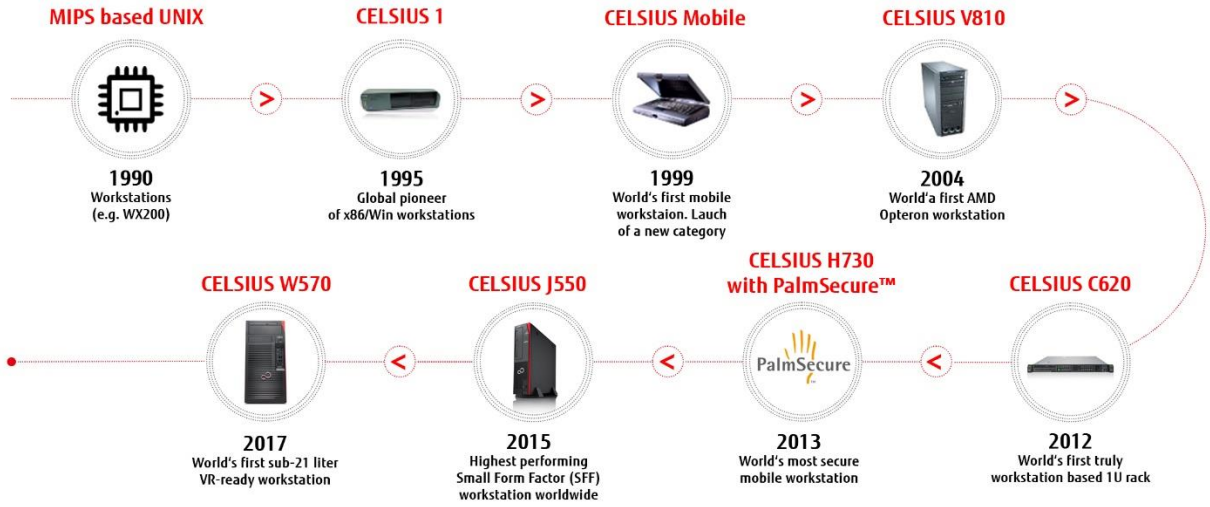

Figure 2: Fujitsu's history in workstations since 1990 (Source Fujitsu)

The CELSIUS Mobile was the world's first mobile workstation (15-inch at that time) and the first mobile workstation of its kind, launched in Oct. 1999.

In 2004 Fujitsu was the First company to launch an AMD Opteron-based workstation, supporting the 64-bit architecture.

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The first 1U rack workstation with professional graphics was launched back in 2012, the FUJITSU CELSIUS C620. It brought workstation performance to the data center. That gave users the opportunity to work remotely with a CELSIUS Remote Access solution.

The next innovation milestones were the first mobile workstation with the innovative PalmSecure, Fujitsu's solution for secure biometric authentication, and the new 10-liter workstation Fujitsu CELSIUS J550 as the first small form factor (SFF) desktop workstation with full-height graphics (Other companies still use low-profile graphics cards).

In 2017, the company introduced the world's smallest, most powerful VR-ready workstation, the CELSIUS W570 power+ - in a 21-liter design.

In early 2016, Fujitsu transferred the Research & Development of Clients products to a new company in Japan, FCCL (Fujitsu Client Computing Limited). And in November 2017, Fujitsu and Lenovo announced the Joint Venture, where Fujitsu sold 51% of FCCL to Lenovo to explore a strategic cooperation in the realm of research, development, design and manufacturing of personal computers for the global market.

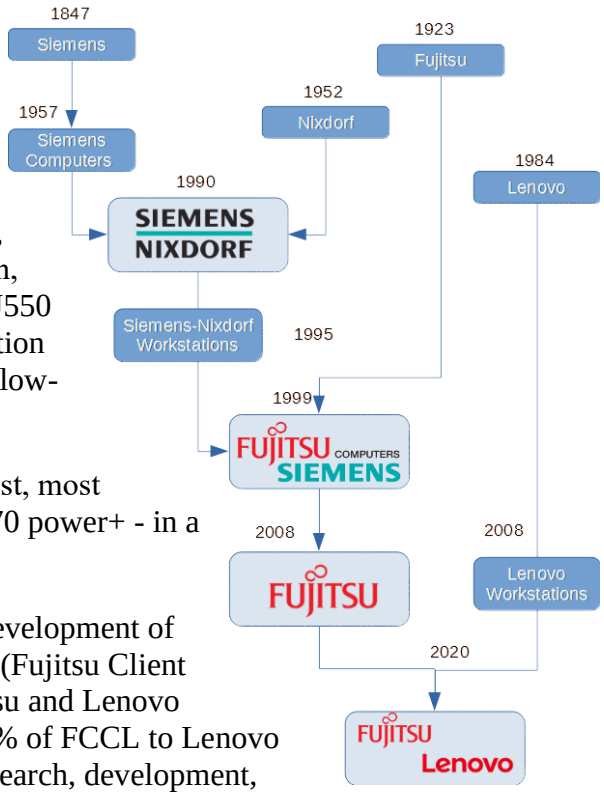

Figure 3: The history of Fujitsu

In early 2020, the Research & Development of Desk-based Client products was transferred to a new company, FCCL GmbH, a subsidiary of the Joint Venture in Germany. The new company will continue to design all the workstations used through the world. Manufacturing will be done in Japan for Asian customers, and in a high-tech manufacturing facility in the Czech Republic for European customers.

Some of the benefits of the joint venture with Lenovo will be the improved optimization of products and increased capabilities in Fujitsu's supply chain. That will be coupled with Fujitsu's already excellent service and support in Europe and Japan.

An overview of Fujitsu WS product line and markets served

The Fujitsu workstation product covers every application segment: CAD, AEC, CAE, media and entertainment (M&E), GIS, financial, and medical. To be able to do that the company has developed a wide range of products. The product line spans from notebooks/ mobile workstations that can draw on the cloud, to powerful stand-alone desktop systems, to super reliable and secure rack-mounted machines with remote access capability (graphics power out of data center).

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Figure 4: A sample of Fujitsu's product line (Source Fujitsu)

Celebrating 30 years of supplying workstations in Japan and Europe, Fujitsu has established its CELSIUS branded systems as reliable and good-looking workstations for its customers. The company claims all of its systems can be customized and delivery times in Europe are very fast, something Fujitsu calls Made4You, Value4You.

Fujitsu's mobile workstations have enterprise-grade security with PalmSecure Fujitsu's palm vein technology. As the name implies, it uses a biometric palm scan to compare one's unique vein pattern.

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Fujitsu workstations are used in all types of applications

Fujitsu CELSIUS Workstations are designed for a broad range of use cases. In Germany and all Europe, Fujitsu serves a broad range of engineering applications. That is especially true for the German midmarket and automotive suppliers. for design and manufacturing of parts, tools and products (CAD applications).

Fujitsu also supports the Media & Entertainment industries. From movies and animations, to German television and radio / broadcasting. Global visual effects companies use Fujitsu workstations in worldwide collaborations.

Fujitsu has developed a tailor-made solution too—its Made4You program. One user is the French leader of video surveillance. In such 24/7 systems reliability of the workstation is critical.

Another mission-critical application is the healthcare industry. Workstations integrated in medical devices must provide very long lifecycles. The following are some specific examples of how people use workstations in some demanding, and sometime very unusual situations.

Big pictures

Fujitsu's most-powerful workstation is at the heart of an ambitious project by Jeffrey Martin, a panoramic (360-degree) photographer based in Prague. Martin was mentioned in the Guinness book of world records for creating the world's largest photo.

In November 2017 he shot 8,000 individual photos from the rooftop of Prague's Old Town Hall using a Seitz Roundshot VR Drive and a 50 Megapixel Canon EOS 5DsR camera.

Figure 5: Jeffery Martin has made the largest single photo of Prague ever made, rendered on a Fujitsu CELIUS R970 workstation (Source Jeffery Martin)

He then used a Fujitsu CELSIUS R970 workstation to stitch the photos into one gigantic 360 panorama image with a total resolution of 500 Gigapixel—the equivalent of 250,000 HD TV screens.

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"A typical Desktop computer would run for a number of days, while the CELSIUS R970 workstation gets the job down within hours."

– Jeffrey Martin, panoramic photographer based in Prague | Gigapixel Panorama Stitching

A typical Desktop computer would run for a number of days, while the CELSIUS R970 workstation cut the job down within hours.

VR views

When designing 360-degree view environments ranging from car configurators, to kitchen designs, and simple games, VR designer Juraj Hudák chose the CELSIUS M770 workstation to get the job done.

Juraj and his company 2Realistic create advanced graphics applications, presentations of products and companies. Their needs create increased demands on hardware which needs to be perfectly balanced for given tasks.

Figure 6: Juraj Hudák computes and renders 360 VR environments on a CELIUS M770 workstation (Source Juraj Hudák)

Hudiak said he and his team need to be able to switch some components quickly and the modular design of CELSIUS M770 satisfied that need for them perfectly.

"I needed a computer that was able to keep up with me; I do a lot of simulations and modeling and I need to run them all in real time. With Fujitsu CELSIUS Workstations, we have got a deal - I do the high-level thinking and it does the math."

– Juraj Hudák, VR designer | Virtual Reality Software Development

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See it before you build it

UYO Architects like to try new things and new approaches. They wanted to share their vision of a new apartment block in Frýdek-Místek in the Czech Republic with an investor but also with end-customers.

Their vision was to open a virtual door to the homeowner's long before the foundations were even laid. They were able to quickly and easily turn their CAD project into interactive, real-time experience by using a mobile CELSIUS H980 workstation. It even allowed them to bring the VR presentation of it to the green fields which were yet to become a house.

AI based digital microscopy

West Medica is a system manufacturer based near Vienna that specializes in medical lab equipment. In particular in the area of image analysis and automated digital microscopy. The company combines high-quality, powerful hardware with modern AI applications in its Vision systems. The systems can be found in laboratories, hospitals and diagnostic centers all over the world.

West Medica was facing a growing issue with the PC they incorporated in their systems. Although West Medica had marketed their Vision solution on their own workstations, the Austrian system builder's design had reached its limits. They kept running into difficulties, particularly when it came to the regulatory requirements for certifying medical equipment. The workstations needed to meet strict requirements. After all, AI-based digital microscopy not only requires especially powerful components and a high computing power but also extreme reliability and security. Electromagnetic compatibility (EMC) also played a key role in the certification process for the overall system.

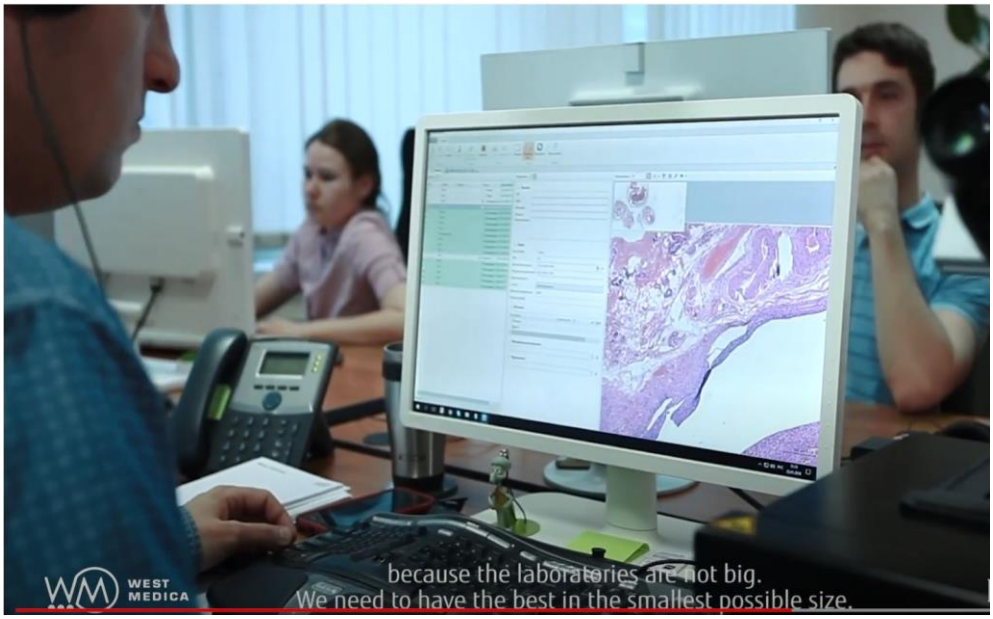

Figure 7: West Medica design their systems to be as small as possible for crowded laboratories (Source West Medica)

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When it came to EMC standards, Fujitsu's CELSIUS W580 consistently came in under the limits. Fujitsu's CELSIUS M770/M7010 desktop workstation did the same. This is due, among things, to the wireless design of the CELSIUS machines. Fujitsu says they use high-end components and a focus on graphics performance, the workstations are also suitable for demanding applications such as image analysis. And Fujitsu says both models also feature extremely low failure rates, thanks to an optimized cooling concept.

> *"With their high-end components and a focus on graphics performance, these workstations are suitable for demanding applications such as image analysis."*
>
> *– Marie Salin, Managing Director, West Medica | AI based digital microscopy*
>
> *The digital microscopy solution from West Medica is now fully certified, and since the fall of 2019 it has been in use by 15 customers worldwide with the workstations from Fujitsu. A special benefit is the new remote function. For example, West Medica can carry out COVID-19 antibody tests without requiring the lab staff to be in the contaminated area, the so-called "red zone."*

The digital microscopy solution from West Medica is now fully certified and has been put in use by multiple labs worldwide, all with workstations from Fujitsu. West Medica has made particularly good use of Fujitsu's new remote function. It has been used in COVID-19 antibody testing without requiring lab staff to be in a contaminated area.

Make movies in less time

Aired on Japan's public broadcasting network NHK, and acclaimed for its elaborate background detail and soundtrack, the hit animation series *Forest of the Piano* was produced by Gaina Co., Ltd.

The TV animation series was directed by Gaku Nakatani, formerly CG supervisor at DreamWorks Animation USA. His challenge was to shorten worktime and produce the best results with limited human resources under a tight schedule. He decided to leverage photogrammetry CG technology as it allowed seamless creation of CG models and textures from photos.

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Figure 8: Gaku Nakatani credits the Fujitsu CELSIUS H workstation with shortening the animation time of Forest of the Piano by six months (Source Gaina)

Gaku Nakatani employed novel photogrammetry techniques in the production of the film. However, the software required extremely fast and high-performance computing capabilities. Without high-performance machines the photogrammetry software would have created a big bottleneck. That is where CELSIUS workstations came into the picture.

"CELSIUS workstations made the photogrammetry possible for this project. We accelerated our work time per episode by about 30% and reduced animation production time by almost six months."

– Yoshinori Asao, President, Gaina Co., Ltd. | Photogrammetry; M&E

The company deployed four CELSIUS M740 Series workstations and a CELSIUS H970 Series mobile workstation. Those robust workstations enabled high-speed production by accelerating the work time per episode by about 30%. In fact, the use of CELSIUS workstations made the photogrammetry possible for this project. In the end CELSIUS workstations from Fujitsu helped shorten 6 months of animation production time for Gaina.

Trends in the workstation market

The workstation market has been shifting toward mobile systems. When the pandemic struck, companies sent their design and engineering people home. For many, it was successful and produced surprising results. With less time wasted commuting and in meetings, many, if not most, were more productive. The lazy ones were still lazy and identified.

But it exposed other issues with some surprising results. For one, it tested the idea of borderless collaboration. Also, organizational weaknesses, including security issues, arose. It revealed the inadequacy of the worker's home systems and security. It also created a new demand in several cases. One alternative to the need for collaboration was moving workloads to the cloud. That had

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surprising effects on corporations. Some organizations had said they'd never let their IP get into the cloud. Others said they might use the cloud someday. Now they were forced to and discovered it had far more benefit than they anticipated. Cloud-based engineering software sales increased. That increased the demand for rack-mounted workstations, as well as mobile workstations.

At first, one might think the companies can't afford the duplication of capital equipment. However, it was cost-effective. It was economical due to added productivity. And savings came from cost reductions of shutting down the main offices. Plus, all workstation suppliers offer financing programs.

Companies with the IT staff and capital budgets are developing a heterogeneous network. The network consists of client devices (from low-end notebooks to giant desktop tower workstations), semi-edge servers (on-campus), and the cloud with rack workstations and individual workstation AIB in big server farms. There is no single configuration, topology, or set of devices.

Part of these networks includes the home user connecting to their office machine. It can then act as a server to run workloads. The results are then sent to the home device as a pixel stream. The home device becomes a virtual machine to the office system.

These expanding and sometimes surprising networks create new opportunities for the workstation suppliers. It also creates opportunities for their software and VAR colleagues in the channel. They also create new management, and IT support challenges—no good thing comes without a cost.

The structure and workflow processes of the engineering community have changed forever. It looks like a change for the good. It is good for collaboration. Good for the environment through less commuting. A temporary boost for hardware and software vendors. And good for the quality of life of all design and engineering people.

Future - continuation of Fujitsu's commitment to Europe.

Fujitsu has been innovative with its product designs and its organizational structure. The company's recent changes improve the future product development, logistics and supply chains. The design and engineering of CELSIUS Workstations will remain in Germany and Japan. This will insure the route from the engineering of the products to the customer is as close as possible.

This proximity is the basis for high quality support. It will also, improve development of future workstation products and portfolio. Hearing the customer's voice has the highest priority on Fujitsu's product direction. The company intends to offer state-of-the-art workstations incorporating the latest technologies. Fujitsu aims to continue their historical success story of CELSIUS Workstations.

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