EXPERT SOFT
software development

Smart Ways to Lower Ecommerce Infrastructure Costs Without Compromising Excellence

Turning heavy lifting into light spending with practical tips for cutting ecommerce infrastructure costs.

How to achieve more while spending less? It's a timeless question that spans every area of life, from optimizing personal budgets to finding the best software tools.

In ecommerce, where every dollar matters, this question can sound like this: How can businesses stay efficient, scalable, and handle high-traffic loads while spending less?

Many have attempted to answer this question, yet the solutions don't always add the mark for enterprise-level needs. We're bringing our expertise to the table to give it another go: "How can enterprises effectively reduce infrastructure costs?"

With years of experience optimizing complex systems for scalability and flexibility, we know what it takes to help large ecommerce platforms manage their systems efficiently.

In this whitepaper, we dive into three core areas that can significantly impact infrastructure expenses. We'll break down both obvious and hidden cost-eaters, provide actionable solutions, and share additional cost-reduction strategies with pro tips and insights drawn from our hands-on experience.

No fluff or filler — just practical strategies and insights. **Let's dive in.**

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Slashing Database Costs

Demanding extensive storage, constant processing power, and high availability to handle massive ecommerce data loads, databases and their costs open up our infrastructure cost battle.

Costs climb as systems scale for peak traffic, maintain redundancy, and run intricate queries. Then there are the less visible expenses, such as data transfer fees from cross-region requests and backups, that silently add up, making database management a critical area for cost control.

So, let's start with a closer look at the main factors that can drive costs here.

DATABASE MAIN COST-EATERS

Below, we'll break down each cost-eater with a brief touch on potential solutions. Why just a brief? Some solutions need extra focus, and we'll dive deeper into those with tips and strategies in the following section.

CPU and Memory Usage

Real-time processing, complex queries, and analytics demand high CPU and memory, especially during peak loads. Powerful instances ensure performance but inflate costs, especially when inefficient queries and poor indexing increase processing demands.

Solution: Fine-tune query optimization and apply indexing to reduce processing strain and resource needs.

Disk/Blob Storage

Ecommerce platforms handle large data volumes, from product catalogs to logs, all requiring significant storage. As data grows, storage fees rise, requiring strategies to manage long-term infrastructure costs.

Solution: Optimize storage by archiving infrequent data and applying data compression.

Managed Database Services

Managed services offer scalability and maintenance but at a premium. Providers charge for automated scaling, support, and redundancy, with costs compounding under enterprise-level demands and high traffic.

Solution: Consider a hybrid or self-hosted solution for predictable workloads to reduce reliance on managed options.

High Availability

High availability maintains uptime with redundancy across regions or zones but requires replicated databases and constant synchronization. This setup increases storage, computing, and network expenses, demanding a balance between availability and cost.

Solution: Use multi-zone deployments selectively and only for critical data.

Data Transfer and Networking Fees

Cross-region data transfers, frequent requests, and backup replications generate unseen network costs. Providers charge for data movement, especially across regions, making it easy for expenses to accumulate rapidly.

Solution: Reduce cross-region traffic and consolidate backups to minimize transfer costs.

COST-REDUCTION STRATEGIES

When moving from specific solutions to high-level ones, there are 5 strategies you can consider.

Current cost analysis and optimization

Being a less radical but still efficient cost-reduction strategy, the path is not always the easiest — sometimes, refining an existing setup is more challenging than starting fresh. Here, you should pay attention to:

Index optimization
Poorly configured indexes increase CPU and memory usage, requiring databases to sift through extensive data to find information. Regularly optimizing indexes speeds up query times, lowering resource demands.

Tip: Focus on optimizing indexes for frequently queried data to make the most impact on performance and cost.

Sharding for load distribution
Sharding, or splitting data across multiple databases, distributes load evenly, reducing bottlenecks. It enables horizontal scaling, often more cost-effective than vertical scaling, by avoiding resource strain on individual instances.

Tip: Apply sharding to high-traffic data segments to reduce strain on individual database instances and minimize costly overprovisioning.

Configuration adjustments
Adjusting configurations, such as memory, cache size, and connection pooling optimizes resource usage, preventing waste. Analyzing usage patterns and fine-tuning parameters avoids excessive costs and infrastructure upgrades.

Tip: Regularly review resource usage metrics to align configurations with actual needs, preventing wasted resources.

To maximize efficiency, make these optimization techniques a continuous practice. Many large enterprises stay ahead by using advanced database monitoring and management solutions: 93% rely on these tools to uncover cost-saving opportunities and prevent resource waste in real time.

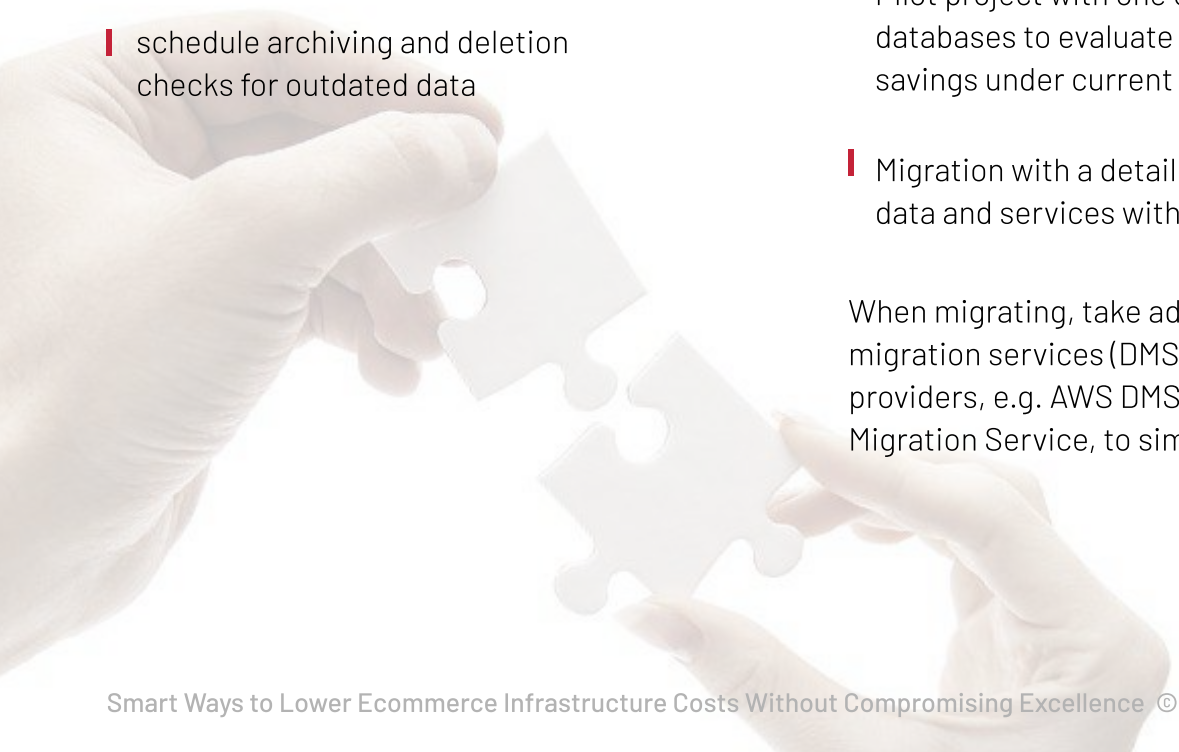
Storage optimization

Storage costs in ecommerce infrastructure tend to rise as databases accumulate vast amounts of product, transaction, and user data. To control these costs, strategies, such as compressing archived data and removing duplicates keep resources focused on active data while minimizing unnecessary expenses.

Pro tip. Implement Data Lifecycle Management (DLM) to organize data through its stages, from creation and active use to archival or deletion. DLM policies automate when data should be archived or deleted, helping avoid the buildup of outdated records and unnecessary storage costs.

Best practices for storage optimization:

- regularly compress and deduplicate archived data
- monitor storage thresholds
- schedule archiving and deletion checks for outdated data



Choosing an alternative database

An alternative database can be a powerful solution to rising infrastructure costs — something we at Expert Soft know well. For example, for a large credit rating agency burdened by high expenses on AWS's DocumentDB, we switched to Atlas DB. The result — annual savings of nearly $500K.

The transition wasn't without challenges: initial performance issues arose as some database queries fetched excess data, slowing things down. Our team tackled this by refining the queries, pulling only the necessary information, which brought performance back in line. Atlas also offered robust support and automatic backups that, combined with cost efficiency, turned a complex migration into a strategic win.

Steps to selecting the database:

- Comparative analysis of performance and cost of various databases with current workloads
- Pilot project with one of the alternative databases to evaluate the actual cost savings under current conditions
- Migration with a detailed plan for migrating data and services with minimal downtime

When migrating, take advantage of data migration services (DMS) from cloud providers, e.g. AWS DMS, Azure Database Migration Service, to simplify the transition.

Going serverless

Serverless databases are like paying for electricity: you're only charged when the lights are on. Unlike traditional setups that run up expenses 24/7, serverless databases scale up or down based on actual demand. For ecommerce platforms facing unpredictable traffic, this model keeps budgets tight, eliminating idle expenses and ensuring resources are at work only when needed most.

Some examples: AWS DynamoDB, Azure Cosmos DB, Google Firestore.

> **Pro tip.** Start with serverless for workloads with fluctuating or unpredictable demand. This lets you scale affordably and pay only for actual usage.

Embracing hybrid database

Think of hybrid databases as a smart storage strategy that keeps the essentials close and the clutter out of the way. High-demand ("hot") data sits on high-performance storage for quick access, while rarely accessed ("cold") data is tucked away in budget-friendly storage. For ecommerce, this approach ensures faster responses for high-traffic items without the overhead of storing everything in the same expensive environment.

Some examples: Amazon S3, Azure Blob Storage.

> **Pro tip.** Regularly monitor data access patterns to adjust storage tiers dynamically—data that's "hot" today might cool down over time. By shifting data between tiers as usage changes, you can continuously optimize storage costs without compromising performance.

THE ROLE OF EXPERT SOFT IN IMPLEMENTING DATABASE COST-REDUCTION STRATEGIES

Optimization of current systems

We can analyze your current databases to identify areas of waste and offer technical solutions to optimize performance and reduce costs, without migrating to a new system.

Migration to a new database

Beyond determining the most suitable database for your needs, the specialists handle all aspects of the migration, including data extraction, transformation, and loading.

Implementing hybrid and serverless solutions

Our team guides you in adopting hybrid or serverless models, strategically balancing performance needs with budget-friendly storage options.

Diving into Cloud Costs

While the cloud is often hailed as the cost-saving option, the reality can be far from straightforward. Ironically, while moving to the cloud promises efficiency, 91% of enterprises end up wasting money due to unpredictable expenses and overlooked cost factors.

With budgets that seem to spiral out of control, many organizations face a harsh reality: unexpected bills for activities they may not even know about, rigid contracts, and high egress costs can lead to financial surprises that weren't part of the original plan. What adds fuel to the fire is the confusing cost of licensed software running in the cloud. All of this leads 37% of businesses to cite unpredictable budgets as a major cloud management pain point.

To help you avoid such unpleasant realities, let's start with the main cost-eaters.

CLOUD MAIN COST-EATERS

Compute Resources
Compute resources, such as virtual machines, containers, and serverless functions, are billed by usage or reserved capacity. While essential, they can become costly when left running during low-traffic periods or overprovisioned for unpredictable workloads.

Solution: Use autoscaling to match compute resources with actual demand, minimizing idle costs.

Storage Costs
Cloud storage fees can add up quickly as data accumulates, especially for long-term backups, media files, and logs. Without regular data management, storage expenses can balloon, adding significant overhead.

Solution: Implement storage optimization practices, e.g. routine data cleanup, archiving, and compression, to minimize unnecessary storage use.

Managed Services
Managed services (e.g., AWS RDS or Google's BigQuery) offer convenience by handling infrastructure maintenance, but they come at a premium. The more services used, the greater the cost impact

Solution: Review shared-economy services and replace them with self-service options. For example, high-frequency AWS Lambda requests can exceed a higher monthly fee than a fee for self-managed options.

Data Transfer Fees
Data transfers across regions or between cloud services incur network fees that often catch organizations by surprise, especially in globally distributed applications.

Solution: Employ multi-cloud strategies to locate data closer to end-users, reducing cross-region transfers.

CLOUD COST-REDUCTION STRATEGIES

Cloud resource optimization

Effective cloud resource optimization goes beyond simply cutting back. It's about fine-tuning infrastructure to meet business needs precisely. By identifying and managing specific resources more strategically, you can reduce unnecessary expenses without sacrificing performance.

Identify unused and unattached resources

Resources like unattached volumes or idle IP addresses often go unnoticed but still incur charges. Set up automated alerts to detect and delete unattached resources monthly.

Optimize idle resources

Resources that remain active during low-traffic periods drive up costs without contributing to performance. Use scheduling tools to shut down non-essential resources during off-peak hours automatically.

Utilize right-sizing

Right-sizing involves matching resource allocations to workload demands, ensuring instances and storage aren't over- or under-provisioned. Regularly analyze workload patterns and adjust resource sizes to meet actual demand, especially after traffic spikes or system changes.

Leveraging discounts and credits

To attract users, cloud providers roll out various pricing models and enticing discounts that seem cost-effective. But that's not always the case, especially in the long run. Take pay-as-you-go pricing—initially, it feels like a smart choice: flexible, straightforward, and tailored to usage.
Yet, as traffic and transactions scale, costs can skyrocket, transforming a budget-friendly option into a significant expense. For high-traffic platforms, predictable discounts often provide far better control over cloud expenses.

What can really make a difference are:

Spot instances

Spot instances allow you to use cloud providers' excess capacity at a discounted rate. They're ideal for flexible tasks that can handle interruptions, offering significant savings on non-critical workloads.

Reserved instances

Reserved instances allow businesses to commit to resources for a specified term (e.g., one or three years), offering lower rates than on-demand pricing. This option suits predictable, continuous workloads that don't fluctuate much.

> **Pro tip.** Consider the AWS Enterprise Discount Program (EDP) that is designed for organizations with high, committed cloud spending. Participation typically requires a long-term contract with AWS, where discounts depend on factors like total annual spending, contract length, and projected growth in cloud usage.

Opting for a multi-cloud approach

Adopting a multi-cloud strategy lets you spread workloads across different providers, playing to each platform's strengths while keeping costs under control. By using specific providers for certain tasks, you can take advantage of competitive pricing without being locked into one vendor.

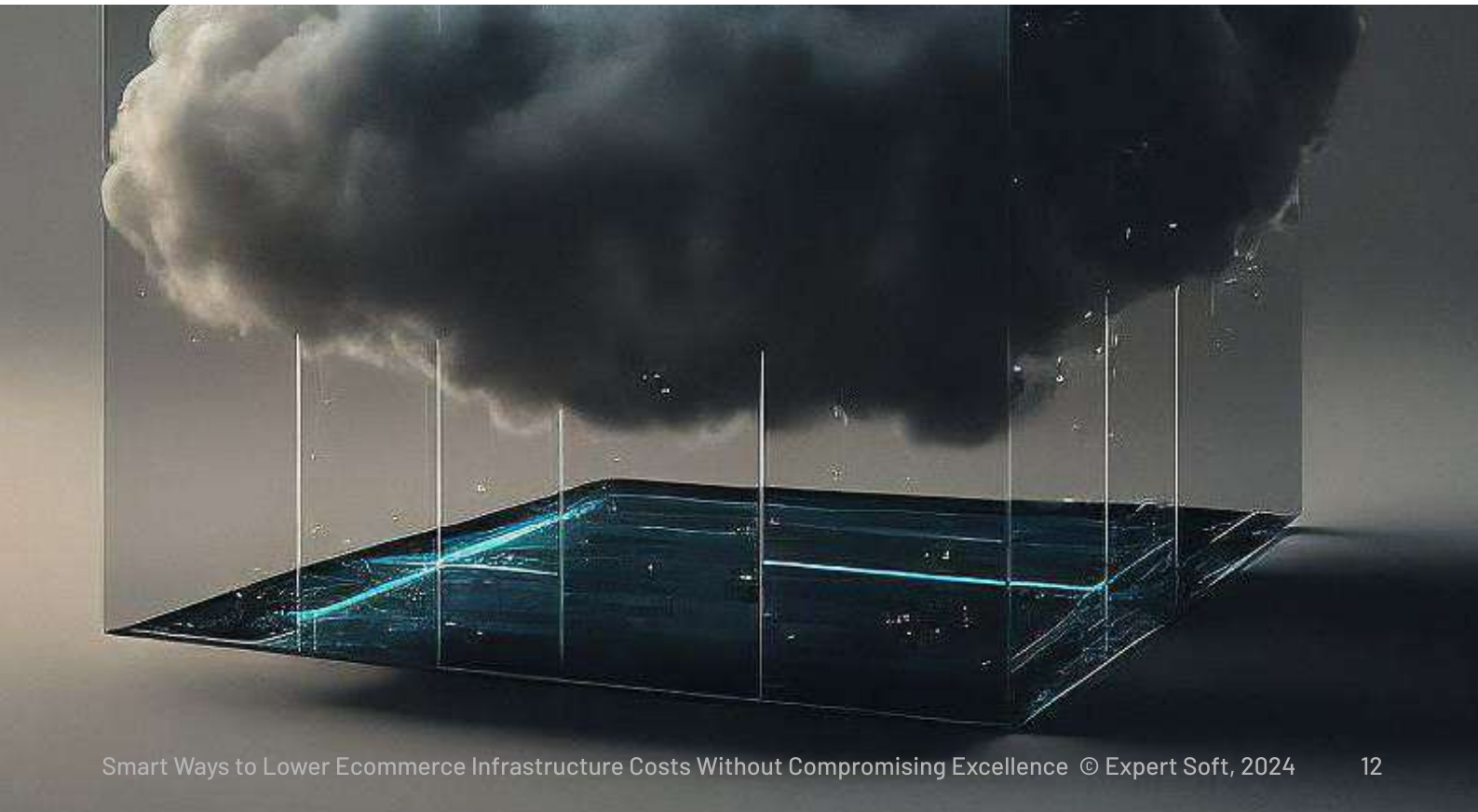
This flexibility reduces the risk of price hikes, avoids overreliance on a single provider, and allows you to pick the best tool for each job, saving on cloud expenses in the long run.

> **Pro tip.** Use AWS Fargate to run containers across multiple clouds without managing infrastructure. Fargate automatically scales with demand, so you only pay for what's actively in use, perfect for handling variable loads efficiently.

Autoscaling

Autoscaling adjusts resources automatically based on real-time demand. This flexibility is especially valuable in ecommerce, allowing resources to scale up to meet peak demand and scale down during off-peak times.

> **Pro tip.** Use AWS Step Functions alongside autoscaling to manage complex workflows efficiently. Step Functions handle tasks sequentially and optimize resource usage, so you only pay for active processes.



Leveraging cloud cost management tools

Cloud cost management tools are like the financial dashboards of your cloud environment, offering detailed insights that make budget control less of a guessing game. It helps you fine-tune spending, catch cost spikes early, and make smarter decisions about resource allocation.

Some examples: AWS Cost Explorer, Azure Cost Management.

Pro tip. Configure automated alerts in your cost management tool to flag any unexpected spending spikes, allowing you to act quickly and keep budgets under control.

HOW EXPERT SOFT CAN HELP WITH CLOUD COST OPTIMIZATION

Seamless Cloud Migration

Expert Soft manages end-to-end cloud migration, moving your applications and data to a new provider or tool that better aligns with your cost and performance needs.

Optimization and Right-Sizing

We fine-tune your cloud resources by right-sizing instances, removing unused elements, and automating scaling where needed. This ensures that you're only paying for the resources essential to your operations.

Resource Management

With proactive monitoring and cost management tools, Expert Soft keeps your cloud infrastructure lean. We set up automated alerts for unexpected spikes and continuously adjust resource usage based on real-time demand.

Reducing CDN Costs

CDNs are essential for fast, seamless user experiences, especially in ecommerce where speed can make or break a sale. But as traffic grows, CDN costs can surprise even the most budget-conscious teams. From handling massive data transfers to supporting global reach, CDNs can quietly eat into budgets if not managed well.

MAIN COST-EATERS AND SOLUTIONS

Data Transfer and Bandwidth Costs

As traffic grows, data transfer fees from delivering media-heavy content can skyrocket. For globally distributed audiences, unoptimized traffic routing further drives up costs.

Solutions

- Segment traffic and prevent unnecessary delivery — route traffic selectively to avoid paying for bandwidth in unnecessary regions.
- Employ multi-CDN setup — use multiple CDNs to split traffic by region, leveraging optimal rates in each area.

Overprovisioning and Unused Capacity

Overestimating CDN requirements often leads to costly overprovisioning, paying for resources that remain unused and idle.

Solutions

- Right-size the CDN plan — regularly assess traffic patterns to choose plans that match actual usage.
- Capacity commitment for discounts — commit to predictable usage levels with vendors for discounted rates, saving on annual costs.

Dynamic Content Costs

Serving dynamic content through CDNs bypasses caching and increases origin server requests, adding to transfer and operational costs.

Solutions

- Split and separate static and dynamic traffic — use distinct DNS subdomains to route each type appropriately, avoiding unnecessary expenses on excessive security or performance measures for static content.
- Cache dynamic API responses when possible — cache semi-static API responses to reduce repeated origin server calls.

Cache Misses and Inefficient Caching

Cache misses, when content isn't on edge servers, prompt costly origin requests, driving up transfer and operational costs.

Solutions

- Optimize cache configurations — set cache durations on static assets to reduce origin fetches.
- Implement a strong caching strategy — pre-cache popular content across nodes to lower cache misses and save on transfer fees.

Handling caching issues is a typical challenge we at Expert Soft solve. Our team ensures optimal performance and content delivery across multiple caching layers, including an additional layer in a headless setup.

About Expert Soft

Expert Soft is a targeted ecommerce software delivery company, partnering with Fortune 500 companies and global corporations across the US and EU. With SAP Commerce Cloud and Java as our backbone, we know how to ensure scalable and high-performing solutions that can handle 1 mln requests per second, delivering a smooth customer experience.

Developing a payment engine that saved our client about $100 million in operational expenses, ensuring multi-country platform support, adapting solutions for new market entry with tailored enhancements — these are just a few of the challenges our specialists tackle.

We aim to deliver more than a software system. We aim to deliver tailored solutions that maximize profitability within available resources. Our success is driven by:

TEAM STRENGTHS

- **All our engineers have a university background**
- **Specialists excel their skills in our training LABs**
- **Perfect English skills**
- **Ready to help 24/7**

CLIENTS

We work with corporations around the world with revenue of over $20 billion and 150K+ employees.

APPROVALS BY AUDITS

Our ongoing work with corporations is consistently validated through rigorous audits, both by internal teams and Big 4 consulting firms.

HIGH-LEVEL SECURITY

Approved by assessments from global companies, who are leaders in their respective industries.

BUDGET EFFICIENCY

By carefully aligning technology investments with your business goals, we ensure optimal value and cost-effectiveness.

PROFESSIONAL TEAM

No offshore outsourcing and our team's average tenure of 4+ years means you get seasoned problem-solvers, not just coders.

EXPERT SOFT EXCELS IN

- PAYMENT ENGINE
- MICROSERVICES ARCHITECTURE
- CONTENT MANAGEMENT
- REDESIGN
- E-COMMERCE PLATFORM
- HEADLESS COMMERCE
- MICRO UI FRONT-END
- MIGRATION&INTEGRATION

OUR TECH CORE

FRONT-END
HTML, CSS, JavaScript (Angular, React, Vue, Next, TypeScript, Jquery), Spartacus

BACK-END
Java EE, Spring, SAP Commerce (Cloud), Node.JS.

DEVOPS
Docker, Kubernetes, CI/CD

UX/UI DESIGN
UX Research, UI Design, Figma, Adobe, Sketch

QUALITY ASSURANCE
Manual Testing, Test Automation

TARGETED DOMAINS

SHARED PATHS, LASTING ECOM VICTORIES

LET'S TALK SOLUTIONS!

MARY MAKARENKOVA
Head of Strategic Client Relations & Customer Success
mary.m@expert-soft.com

Let's connect

PAVEL TSARYKAU
CEO & Founder of Expert Soft

Let's connect

expert-soft.com

LinkedIn