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The impact of AI-powered car damage recognition on global insurance practices

Market overview

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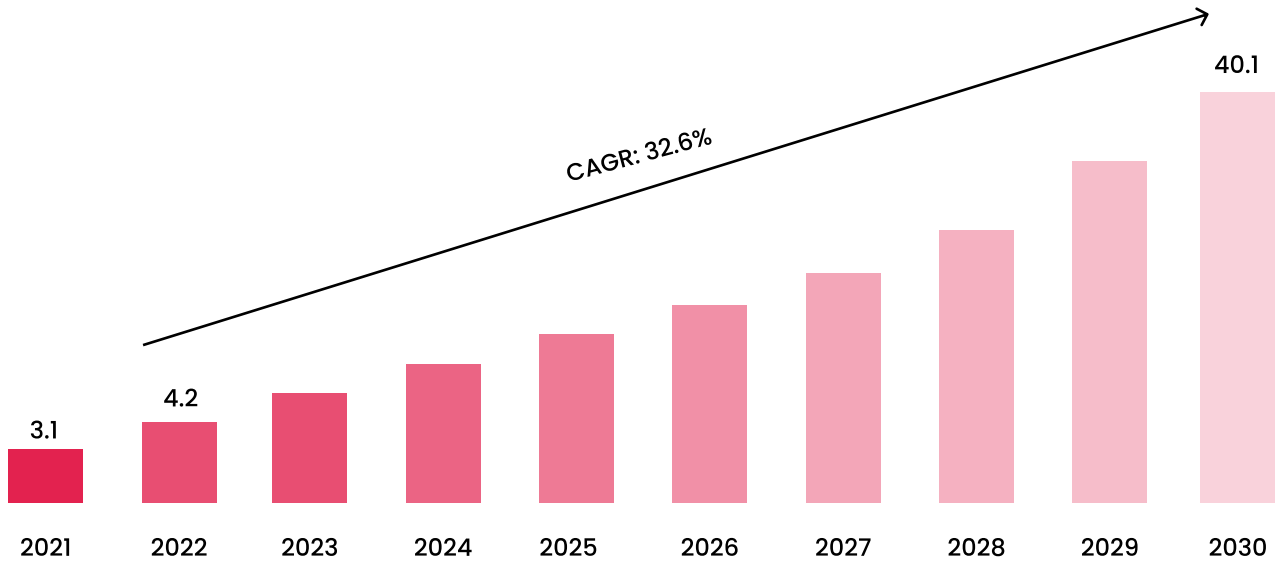
This white paper explores the transformative potential of car damage recognition software, using advanced technologies like machine learning to streamline the way car damage is evaluated across global markets. Focusing on Europe, North America, and South America, we examine the statistics of road accidents involving property damage, the associated costs of damage appraisal, and the compelling need for innovative solutions in this domain.

Introduction

The digital transformation is rapidly approaching businesses within the insurance industry, presenting new challenges and opportunities simultaneously. One of these opportunities is the use of image recognition technology for damage identification and assessment. The adoption of modern technologies can improve the way insurers interact with customers, streamline operations, improve risk assessment and management, and much more.
In 2021, the global market size of AI hardware, software, and services in the insurance industry amounted to $3.1 billion. The compound annual growth rate (CAGR) of 32.6% for this niche is predicted for the 2022 - 2030 forecast period. This trend appears to indicate that despite the high growth rate, the market is far from saturated.

AI IN INSURANCE

global market size and growth



Car damage recognition tools use advanced image recognition technologies to assess damage from photographs of the vehicle, allowing for quick, accurate evaluations. This not only speeds up the claims process but also reduces the dependence on manual assessments, leading to more consistent and objective results.

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Claim processing workflow with computer vision system involvement

Online insurance claim submission

Automated vehicle inspection and cost estimation

ML guided workflow

Insurance payment

The car damage recognition system serves four key functions:

- **Accident investigation:** The system allows uploading photographs of the target vehicle and surrounding vehicles involved in the accident. It then performs intelligent recognition of the images, facilitates information input, and finalises the accident event details.
- **Car damage assessment:** The system performs damage recognition on the uploaded images to assess the extent of damage.
- **Damage result output:** Based on the damage recognition results, the system automatically provides recommendations for repair procedures and estimated repair costs.

Vehicle insurance anti-fraud: During the repair process, the system employs image fraud recognition and logical detection to screen for potential insurance fraud related to vehicle damage.

These tools assist operators in the initial process of identifying car damage. Operators simply upload the required photographs, and the system automatically detects the damaged components and assesses the severity of the damage. Behind the scenes, the system provides supplementary damage assessment and anti-fraud services. It can detect potential fraud cases through logical recognition of vehicle parts and image fraud recognition. This dual functionality meets the demands for fraud prevention and loss mitigation simultaneously.

The car damage recognition system is designed to evaluate exterior damage on passenger vehicles, including sedans, SUVs, MPVs, and vans. It can assess all types of exterior vehicle damage, operating effectively under various environmental conditions. These include rain, snow, low light (where the vehicle is visible to the human eye), and bright lights.

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The current state of car damage appraisal

The car damage appraisal process is a major step in the post-accident workflow for insurance companies worldwide. This section examines the current landscape of car damage appraisals across various global regions, particularly focusing on three key aspects:

- **The volume of accidents involving property damage:** Understanding the frequency and scale of accidents that result in vehicle damage is essential to gauge the demand for damage appraisal services.
- **The associated costs of employing damage appraisers:** Insurance companies must assess the financial implications of hiring and deploying a workforce dedicated to evaluating vehicle damage.
- **The economic implications for the insurance industry:** Analysing the overall economic impact of the car damage appraisal process on the insurance sector, including factors such as claim processing times, operational costs, and customer satisfaction.

Europe

In Europe, there is a notably high prevalence of accidents that only result in property damage, highlighting the significant need for efficient processes to appraise and address such damage:

SLOVAKIA:
Records 30,000 accidents, constituting 78% of all accidents, with an annual average expense of €35,000 per appraiser.

CZECH REPUBLIC:
Witnesses 84,000 accidents (83% of accidents), with an average expense of €46,000 per appraiser.

POLAND:
Reports a staggering 298,000 accidents (91% of accidents) with a relatively lower average expense of €15,000 per appraiser.

HUNGARY:
Sees 31,000 accidents, accounting for 53% of all accidents, and each appraiser costs around €12,000 annually.

AUSTRIA:
Experiences 143,000 accidents (86% of accidents), with around 200 insurance companies employing an average of 15 appraisers each, costing €46,000 per appraiser per year.

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SWITZERLAND:
With 68,500 accidents (75% of all accidents), the country has the highest appraiser cost at €97,000 annually.

FRANCE:
Has 401,000 accidents (75% of accidents), emphasising the market potential for car damage recognition tools with its robust automotive industry.

BELGIUM:
Registers 134,000 accidents with property damage only, which make up 64% of all accidents. Each appraiser costs an average of €61,000 annually.

NETHERLANDS:
Shows 110,000 accidents with property damage only, contributing to 21% of all accidents, with a consistent appraiser expense of €61,000 per year.

DENMARK:
Has 19,000 accidents with property damage only, comprising 82% of all accidents, with a substantial appraiser expense of €90,000 per year

SWEDEN:
Encounters 22,000 accidents with property damage only, representing 31% of all accidents, with an average appraiser cost of €62,000 annually.

SPAIN:
Reports 464,000 accidents with property damage only, which accounts for 82% of all accidents. Average expense per appraiser is €55,000/year.

ITALY:
Experiences 1 million accidents with property damage only, accounting for 81% of all accidents, with each appraiser costing an average of €62,000 per year.

UNITED KINGDOM:
Faces 334,000 accidents with property damage only, making up 70% of all accidents, with an average appraiser cost of €82,000 per year.

The data from various European countries underscores a trend in the high prevalence of property damage-only accidents, with such incidents accounting for a substantial proportion of total accidents, often surpassing 70%. The financial impact of these accidents is notable, with appraiser costs varying significantly across different countries—from as low as €12,000 annually in Hungary to as high as €97,000 in Switzerland. This variability suggests a potential disparity in the cost efficiency of appraisal processes across Europe.

Additionally, the sheer volume of such accidents, particularly in countries like Italy with up to 1 million incidents, highlights a crucial market for innovations in car damage recognition and efficient damage appraisal systems. Enhancing these systems could lead to significant cost savings and improved processing times, which is essential given the economic scale of these incidents.

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North and South America

The American continents also reflect a similar pattern with high volumes of property-damage-only accidents and significant appraisal costs:

The USA leads with 4.5 million accidents (67% of all accidents) and an average appraiser expense of $74,000/year.

MOST DANGEROUS STATES RANKING	STATE	TOTAL FATAL CAR ACCIDENTS PER CAPITA	TOTAL KILLED IN CAR ACCIDENTS PER CAPITA	PERCENT CHANGE IN FATALITIES YOY	PERCENT OF FATALITIES FROM SPEEDING	PERCENT OF FATALITIES FROM IMPAIRED DRIVING
1	Montana	0.017	0.019	16%	39%	51%
2	South Carolina	0.019	0.020	6%	46%	36%
3	Wyoming	0.015	0.022	-14%	33%	39%
4	Missouri	0.015	0.016	12%	43%	37%
5	New Mexico	0.017	0.019	6%	40%	36%
6	South Dakota	0.012	0.016	38%	30%	40%
7	Texas	0.012	0.013	7%	37%	45%
8	Arkansas	0.019	0.021	25%	26%	32%
9	Louisiana	0.016	0.018	14%	23%	35%
10	North Carolina	0.013	0.015	6%	32%	35%
11	Mississippi	0.023	0.025	17%	17%	25%
12	Arizona	0.013	0.014	8%	33%	32%
13	Maine	0.011	0.012	4%	29%	44%

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MOST DANGEROUS STATES RANKING	STATE	TOTAL FATAL CAR ACCIDENTS PER CAPITA	TOTAL KILLED IN CAR ACCIDENTS PER CAPITA	PERCENT CHANGE IN FATALITIES YOY	PERCENT OF FATALITIES FROM SPEEDING	PERCENT OF FATALITIES FROM IMPAIRED DRIVING
14	Alabama	0.017	0.019	0%	28%	31%
15	Wisconsin	0.010	0.010	8%	35%	39%
16	Colorado	0.010	0.011	4%	46%	34%
17	North Dakota	0.012	0.013	0%	26%	40%
18	Oregon	0.011	0.012	3%	24%	44%
19	Illinois	0.009	0.009	18%	39%	37%
20	Tennessee	0.016	0.017	7%	15%	31%

CANADA:
Reports 117,658 accidents (77% of all accidents) with an average expense of $85,000 per appraiser.

ARGENTINA:
Experiences 240,000 accidents with property damage only, which constitute 50% of all accidents, with an average appraiser cost of $38,000 per year.

BRAZIL:
Encounters 1.2 million accidents with property damage only, accounting for 75% of all accidents, with an appraiser cost of $13,000 annually.

CHILE:
Registers 98,000 accidents with property damage only, making up 60% of all accidents, with each appraiser costing $27,000 per year.

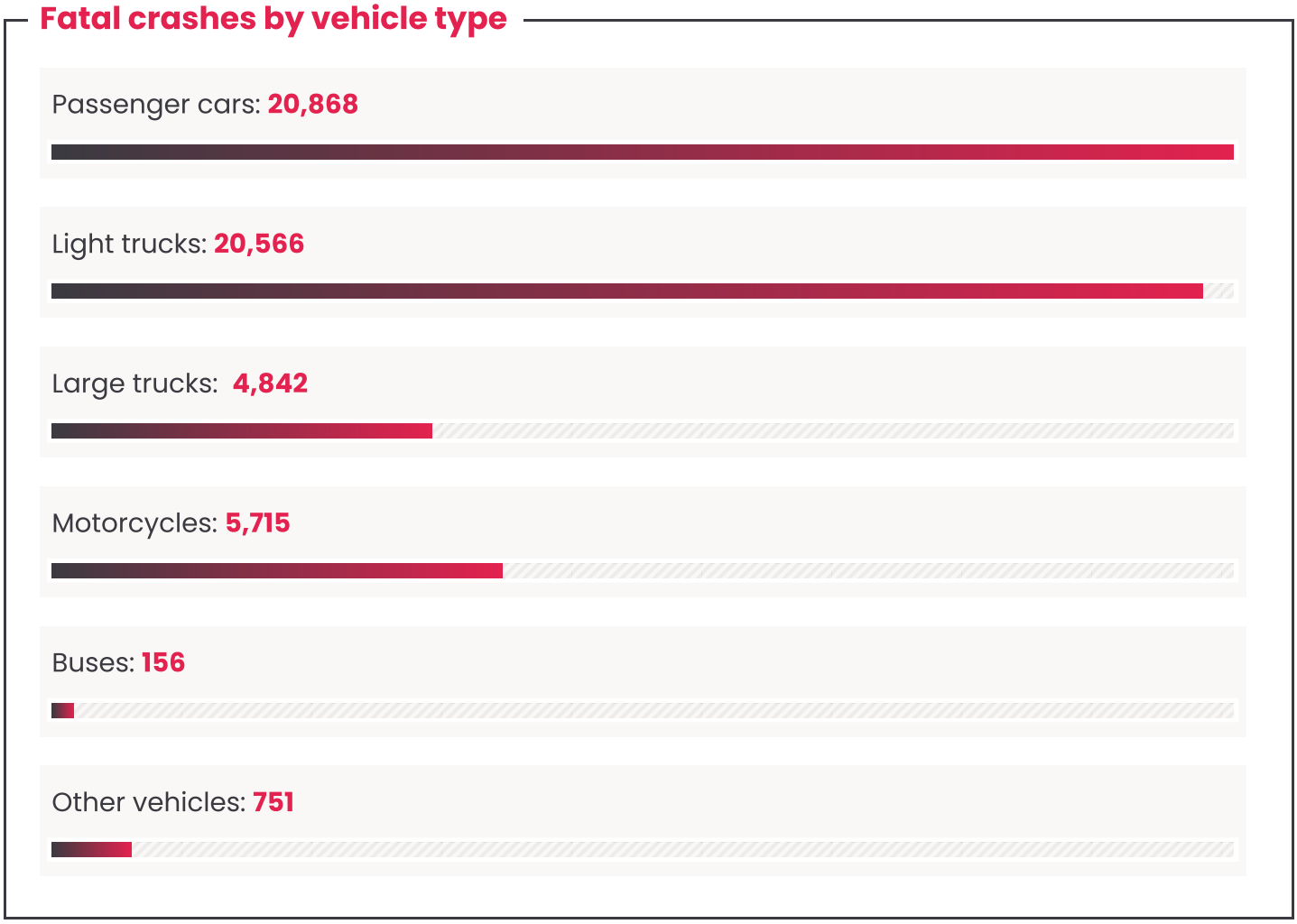
COLOMBIA:
Sees 73,000 accidents with property damage only, which account for 55% of all accidents, with an average expense of $13,000 per appraiser.

ECUADOR:
Reports 70,000 accidents with property damage only, constituting 70% of all accidents, with an average expense of $16,000 per appraiser.

Accidents by vehicle type

The car accident statistics show that some modes of transportation are riskier than others:

Fatal crashes by vehicle type



The cost of appraising damage varies considerably from country to country. Canada, despite having fewer accidents than Brazil, incurs a much higher average expense per appraiser ($85,000). In contrast, countries like Brazil and Colombia spend significantly less ($13,000), which might reflect differences in labour costs, the severity of the accidents, or efficiency in handling claims.

Economic implications

The above analysis highlights a significant financial burden on insurance companies due to the high costs associated with hiring and maintaining teams of appraisers across numerous markets. European countries, with their dense populations and high rates of vehicle ownership, have a pressing need for more cost-effective appraisal methods. The same holds true for North and South American countries, where the volume of traffic and frequency of accidents require a scalable solution to manage costs effectively.

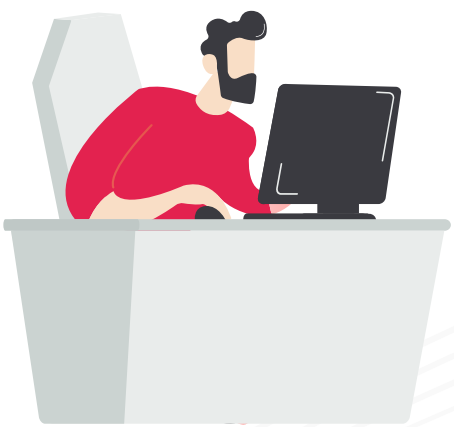
Given these statistics, the potential for technology-driven solutions like car damage recognition software becomes evident. Such technologies can automate the appraisal process, reducing economic strain while enhancing accuracy and efficiency. This paves the way for a transformation in how vehicle damage assessments are conducted globally.

Technological advancements in car damage recognition

Car damage recognition software employs machine learning algorithms and computer vision to accurately and swiftly assess damage. This technology can process images of the damaged vehicle, compare them against databases of similar incidents, and produce damage estimates in real time.

Beyond just detecting damage, some cutting-edge solutions can also generate detailed repair estimates and statements of loss automatically. This automation reduces manual effort, minimises human error, and accelerates turnaround times for insurance claims.

As the technology matures, integration with smartphone apps and insurer platforms enables policyholders to easily submit claims by uploading photos for instant damage assessment. This accessibility and convenience further drive the adoption of these AI-powered damage recognition tools.



Benefits of car damage recognition software

Here are some of the key benefits of car damage recognition technology:

- **Cost savings:** Automating the damage assessment process using image recognition technology can significantly reduce labour costs associated with employing human appraisers. As a result, insurance companies can realise substantial savings. A report by McKinsey suggested that digital and analytics advances (including damage recognition technologies) could reduce claims expenses by 25% to 30% through improvements in efficiency and accuracy.
- **Increased efficiency:** Car damage recognition software evaluates damage almost instantly, dramatically reducing the time required for appraisals compared to manual processes. This improved efficiency enables quicker claims processing and payouts.
- **Consistent and objective assessments:** AI-powered damage recognition eliminates subjective human biases and ensures data-driven damage evaluations across all cases. This objectivity improves fairness and trust in the claims process.
- **Improved accuracy:** With ongoing training on large datasets, these systems can achieve high levels of precision in identifying and categorising different types of vehicle damage, reducing costly inaccuracies.
- **Enhanced customer experience:** Allowing policyholders to submit claims simply by uploading photos creates a smooth and user-friendly experience and expedites the entire process from their perspective.
- **Scalability:** As demand fluctuates, software solutions can easily scale up or down, eliminating resource limitations faced by human appraisal teams during high periods.
- **Data-driven insights:** The data collected from automated assessments can reveal valuable insights into damage patterns, facilitating more effective risk monitoring and pricing models for insurers.

COMPARISON FACTOR	COMPUTER VISION POWERED CAR DAMAGE DETECTION	MANUAL CAR DAMAGE DETECTION
Cost	Average to high investment expenses. Low cost per assessment case	Average to high investment expenses. Low cost per assessment case
Quality	Quality depends on the use case, pictures taken, and the type of damage	High Quality. Better capabilities for in-depth examination

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COMPARISON FACTOR	COMPUTER VISION POWERED CAR DAMAGE DETECTION	MANUAL CAR DAMAGE DETECTION
Supported quantity of assessment cases	Sufficient for extreme quantities of assessment cases	Depends on staff size
Difficulty setting-up	Extremely fast: seconds	Moderate to fast: hours to days
Turnaround time	Challenging to set up but easy to maintain	Challenging to set up and maintain
Workforce safety	Doesn't hold labor safety risks	Holds moderate labor safety risks
Best suitable assessment cases	Vehicles with well-visible damages on the outer surfaces	Flooded vehicles and vehicles with internal damages

Overall, car damage recognition technology drives operational efficiencies, cost optimisation, and improved customer satisfaction, making it an attractive proposition for forward-thinking insurance providers.

Implementation challenges

While the benefits are clear, the implementation of such technology comes with its challenges. These include:

- **Integration with existing systems:** Ensuring the new software integrates smoothly with existing claims processing systems within insurance companies.
- **Regulatory compliance:** Adhering to global and regional regulations regarding data privacy and the use of artificial intelligence in decision-making.
- **Training and adaptation:** Employees must be trained to operate new systems, and there may be resistance to change from traditional methods to automated processes.

Conclusion

In the future, we will continue to explore the innovation of insurance technology of AI and vehicle insurance. On the one hand, the owner can take photos with one click to achieve rapid loss determination, price estimation, and immediate compensation. On the other hand, it assists insurance companies in achieving rapid and accurate pricing in the process of fixing losses and claims.

The adoption of car damage recognition software represents a forward-thinking solution that offers substantial benefits for insurance companies. These benefits include cost reductions, enhanced processing speeds, improved accuracy, and increased customer satisfaction.

As the car and insurance industries grow and change, adopting new technologies like car damage recognition software is essential for companies that want to stay competitive and meet the growing expectations of the market and their customers. The path forward involves not only adopting these new technologies but also adapting to the broader digital transformation taking place within the industry.

Choose the car damage recognition solution built by Altamira

Altamira offers a solution powered by machine learning that uses photos captured with a smartphone to instantly detect dents, scratches, and minor body defects in vehicles. This revolutionary technology makes it possible to activate insurance policies on the spot without any need for expert assessment.

01. Recognise a car

Our system automatically assesses the car's colour and model, its angle, and the level of damage. It also recognises whether the image was modified to prevent fraud.

02. Identify damage severity

Our damage recognition solution allows quick understanding and assessment of the level of damage to a car and the location of the damaged components. It also allows for detecting whether the car is really damaged as a result of a car incident or just dirty.

03. Estimate the repair cost

By analysing data from a large number of repairs, car damage detection using machine learning can identify patterns and trends in the cost of different types of repairs. This can help to ensure that repair costs are estimated accurately and that insurance policies are priced fairly.

For insurance companies

Simplify the process of assessing a vehicle's body condition with AI. Our solution provides a high level of precision, allowing insurance policies to be activated instantly and making it easier for car owners to obtain insurance coverage quickly and efficiently.

- Fast and precise damage assessment
- Improved signing speed and efficiency
- Decrease the level of fraud
- Increased customer satisfaction and loyalty
- Reduced costs and processing time

For car rentals

Streamline the vehicle inspection process, reduce the time and labour required for manual inspections, and improve the accuracy and consistency
can get valuable insights into the condition of the fleet, which allows you to prioritise repairs and maintenance and optimise your operational efficiency.

- Speed up the assessment process
- Decreased operational costs

- Increase retention rate
- Improved customer experience
- Better fleet management

For carsharing companies

Automatically detect any damage and flag it for repair. Our solution saves your time and reduces errors, as well as ensures that all damage is properly identified and addressed. Additionally, by automatically detecting and documenting damage, our solution provides a clear record of the condition of a vehicle at the time it was rented.

- Safer rental process
- Improved fleet maintenance
- Increased customer satisfaction
- Cost savings
- Better risk management

Online car marketplace

Streamline the inspection process, reduce the time and labour required for manual inspections, and improve the accuracy of damage assessment. We help you prevent disputes with buyers over pre-existing damage, as well as reduce the likelihood of fraud or false claims of damage.

- Faster listing process
- Better trust and transparency
- Improved listed vehicle quality
- Cost savings
- Increased efficiency

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About Altamira

We provide solutions that make a tangible impact to our clients' growth and productivity. With domain knowledge across product and technology development, we aim to provide cost-efficient solutions without compromising quality. We are driven to deliver the best, every single time.

We specialise in:

- Technology consulting and continuous productivity improvement of software development
- Vendor transfer utilising proven approach
- Mobile and web product development and end-to-end delivery
- Delivering Artificial Intelligence solutions to improve productivity and bring new capabilities
- Fast and efficient team augmentation, whether in-house, outsourced, or distributed

We set ourselves apart by combining technical expertise with business acumen, creating long-lasting partnerships with our clients.

To us, your software is more than a code - it's a bespoke solution delivered with care by our team of digital nomads with a people-first approach, quality as a core value, and a strong commitment to your success.

Have a question? Let's talk.
We love to help our clients be successful!

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