A New Era in Operating Rooms with Artificial Intelligence:

AI-Powered Surgical Assistant Solution

CURE VISION

CHALLENGES WE FACE

01

Manual documentation	>	**Time loss, higher risk of errors, surgeons' attention diverted from the procedure**
Lack of real-time decision support	>	No systematic support at critical moments
Insufficient integration	>	Disconnected HIS, PACS, EHR and devices
Language & procedure	>	Misalignment in multinational and multi-specialty teams

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CURRENT METHODS AND THEIR LIMITATIONS

02

Manual note-taking & reporting	>	Time-consuming, high risk of errors
Limited voice command systems	>	Only basic device control, no contextual awareness
Passive use of video data	>	Recording exists, but no contribution to analytics, reporting, or training
Common problem	:	Lack of real-time and contextual Support

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KPIs WE AIM TO IMPROVE

03

Operational efficiency ↗	>	Documentation time is reduced
Error rate ↘	>	Critical risks are minimized
Time management ↗	>	Reporting becomes faster
Surgical quality & consistency ↗	>	More standardized and reliable outcomes
Patient safety & satisfaction ↗	>	Higher perceived quality and sense of trust

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DEVELOPMENT OF THE SOLUTION

AI-powered surgical assistant	›	Developed by in-house teams
Surgeons & OR staff	›	Actively involved in the development process
AI models	›	Trained specifically for different procedures
Data security & regulatory compliance	›	Treated as a top priority during development
Result	›	A user-centric solution that is both technically robust and clinically aligned

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AI TECHNOLOGIES USED

05

Voice models	>	Transcription aligned with medical terminology
Vision models	>	Detection of critical moments from camera feeds
Large Language Models (LLMs)	>	Summarization, reporting, and documentation support
Integrated system	>	A digital assistant working alongside the surgeon

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DATA SOURCES AND TRAINING PROCESS

Audio data	Open-source, cleaned, and manually transcribed
Text data	Textbooks, academic articles, and scientific literature
Image/video data	Academic + synthetic datasets
Training duration	1–15 days (depending on the model)
Model performance	Evaluated using dedicated test sets & medical exam (TUS) questions

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TECHNICAL CHALLENGES WE FACED

Data quality	>	Noise & echo mitigated with advanced signal processing
Terminology alignment	>	Re-trained with domain-specific data
Real-time performance	>	GPU/CPU optimization, quantization, pruning
Data security	>	GDPR & HIPAA-compliant anonymization implemented
Hallucination issue	>	Reduced through prompt engineering

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PILOT STUDIES & PREPARATION PHASE

Pilot infrastructure	>	Completed; preparations for clinical phase are ongoing
Ethics approval	>	Process is in its final stage
Collaboration	>	Pilot deployment planned with Akdeniz University
First steps	>	Clinical data access, ethics approval, controlled tests

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CONTRIBUTIONS ACHIEVED

Innovation culture	>	Strengthened within the company
Data-driven mindset	>	Extended to other projects
R&D processes	>	Adopted a more clinically focused approach
Regulatory alignment	>	Increased awareness of data security and compliance

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SCALING & APPLICATION AREAS

Surgical specialties	›	Easily adaptable to different branches
Multilingual capability	›	Ready for international use
Beyond the OR	›	Post-op workflows, robotic surgery, medical education
New integration domains	›	HIS, PACS, IoT devices, patient monitoring systems
Academic use	›	Valuable data source for clinical research

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VALUE ADDED TO THE INDUSTRY

Decision support	>	Systems are standardized
Reporting	>	Manual workflows replaced by automated processes
Patient safety	>	Critical errors prevented through proactive alerts
Multilingual use	>	Procedure-independent, scalable globally
Clinical improvement	>	Insights from surgical data drive quality & performance gains

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IMPLEMENTATION PROCESS

Pilot deployments	>	Limited case testing across different specialties
Validation	>	Tested in real surgical environments
Optimization	>	System refined using user feedback

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INTEGRATION PLANS

Surgery management	›	API integration with existing hospital systems
Device data	›	Real-time processing of camera and audio device streams
Patient records	›	Automatic addition of structured reports into information systems
Hardware infrastructure	›	Smooth processing of high-volume data
Support for surgeons	›	Real-time digital assistant during operations

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SUSTAINABLE IMPACT

Economic impact	Higher efficiency, reduced costs, fewer re-operations
Social impact	Increased patient trust, reduced administrative burden, higher job satisfaction
Environmental impact	Paperless workflows enable energy and resource savings

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1–3 YEAR VISION

Widespread adoption	›	Deployment in university hospitals & private healthcare groups
Specialty-based models	›	AI models tailored to different surgical domains
Deep integration	›	Alignment with HIS, PACS, and robotic surgery platforms
Decision support	›	More advanced and proactive mechanisms
Beyond the OR	›	Expansion into post-op follow-up, clinical reporting, and medical education

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INTERNATIONALIZATION

Target markets	Expansion into Europe, the Middle East, and North America
Compliance	Architecture aligned with GDPR & HIPAA standards
Strategic partnerships	Collaborations and investment initiatives
Global vision	Becoming a strong and sustainable player in the global healthcare ecosystem

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