



AEROSPACE

AUTOMOTIVE

POWERTRAIN

RAILWAY

“...let's not make things any worse by guessing”

*“Gene Kranz”
NASA Flight Director*

ENGINEERING CONSULTING COMPANY

Twenty years of Experience in Design & Virtual Simulation

AEROSPACE



AUTOMOTIVE



POWERTRAIN



RAILWAY



AEROSPACE

CONCEPT & DESIGN DEVELOPMENT

- Wings
- Fuselage
- Empennage
- Tailgates
- Landing Gears

STRUCTURAL VERIFICATION & VALIDATION

- FE Model Build & Analysis
- Fatigue & Damage Tolerance
- Hand Calculation
- Certification Report
- Production Assistant (MRO&Concessions)

FLIGHT CERTIFICATION

- Residual Strength Analysis:
 - Wing Fuselage
- Full Scale Static, Fatigue Test:
 - Test Loads discretization
 - non-destructive testing
 - Certificate Report

CUSTOMERS (TIER 1&2)



AUTOMOTIVE

CONCEPT & DESIGN DEVELOPMENT

- Style Feasibility
- Body & Closures
- Exterior Trim
- Production Technology : Plastic, Metallic

STRUCTURAL VERIFICATION & VALIDATION

- FE Models Determination & Validation
- Static & Stress strength analysis

SAFETY

- Front, Side & Rear Crash: EuroNCAP
- Bumper Low-Speed Impact: ECE42
- Interior Head impacts: ECE21

CUSTOMERS (TIER 1&2)



POWERTRAIN

CONCEPT&DESIGN DEVELOPMENT

BASE ENGINE

- Cylinder Head
- Engine Block
- Intake & Exhaust
- Water Pump & Circuit

ENGINE SYSTEM

- Refueling System
- FLVV Valve & MFI Modules
- Diesel & Adblue Tanks
- Connector & Pipe lines

STRUCTURAL VERIFICATION&VALIDATION

- Multibody Analysis
- FEA & Noise Vibration Harshness
- Fatigue & Durability (FRF & PSD)
- Biphasic CFD Analysis
- Preliminary Shut Off
- De-Icing Prediction

HANDLING, COMFORT&PERFORMANCE

- Axle Whine
- Isolation Effectiveness
- Engine Excitation Boom
- Prop Shaft Out of Balance
- Vibration Absorber
- Radiated Noise

CUSTOMERS (TIER 1&2)



MECHANICAL DESIGN TOOL SKILLS

MAIN SOFTWARE

CATIA V5

UG NX

ONSHAPE

CREO



SIEMENS



RAILWAY

CONCEPT & DESIGN DEVELOPMENT

- Carbody Structure (Bodyshell)
- Interior & Exterior case trim
- Equipments case
- Bogie
- Anti-roll and anti-shake systems
- Electrical & Hydraulic systems
- Lubricating systems and Sanding device
- W & G

STRUCTURAL VERIFICATION & VALIDATION

- Virtual Simulation
- FEA & Manual Calculation
- Certificate report

European Regulations: EN: 12663,1993 ,1999

RAILWAY & TRAM CART

- Hight-Speed train
- Underground Train
- Tramway Train

CUSTOMERS (TIER 1&2)



VIRTUAL SIMULATION TOOL SKILLS

MAIN SOFTWARE

STRUCTURE | MBS & NVH

- NASTRAN
- OPTISTRUCT
- ADAMS
- ABAQUS

DURABILITY

- VIRTUAL LAB
- FEMFAT
- HAND CALCULATION

SAFETY

- ABAQUS EXPLICIT
- RADIOSS

CFD

- FLUENT
- ACUSOLVE



ELECTRONIC DESIGN TOOL SKILLS

MAIN FIRMWARE TOOLS

IAR EMBEDDED WORKBENCH



IAR Embedded Workbench

KEIL UVISION5



STM32CUBEMX & IDE



CODEWARRIOR



MPLAB X IDE



MAIN SOFTWARE TOOLS

VISUAL STUDIO C#-BASIC



LAB WINDOWS/CVI



ELECTRONIC DESIGN TOOL SKILLS

MAIN HARDWARE TOOL

ALTIUM DESIGNER

Altium
Designer.

MAIN CIRCUIT SIMULATION TOOL

LTSPICE BY ANALOG DEVICES



AHEAD OF WHAT'S POSSIBLE™

MAIN THERMAL SIMULATION TOOL

MENTOR GRAPHICS FLOTHERM XT

SIEMENS

PARTNERSHIP

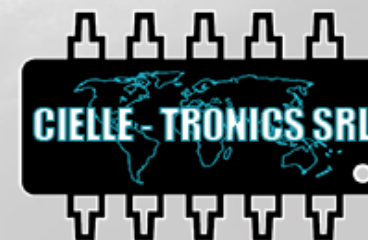
From 2023 Ellea Ingegneria and Cielle-Tronics become strategic partners

ELLEA INGENGERIA



MECHANICAL DESIGN
MECHATRONIC DESIGN SYSTEMS
VIRTUAL SIMULATION & VALIDATION
PROJECT MANAGEMENT

CIELLE-TRONICS



HARDWARE & SOFTWARE DESIGN
ELECTRONIC PROTOTYPING SYSTEMS
ELECTRONIC PRE SERIES PRODUCTION SYSTEMS
AUTOMOTIVE LIGHTING DESIGN (OPTICS & PLASTIC PARTS)



AEROSPACE

AUTOMOTIVE

POWERTRAIN

RAILWAY

COMPANY DIVISION

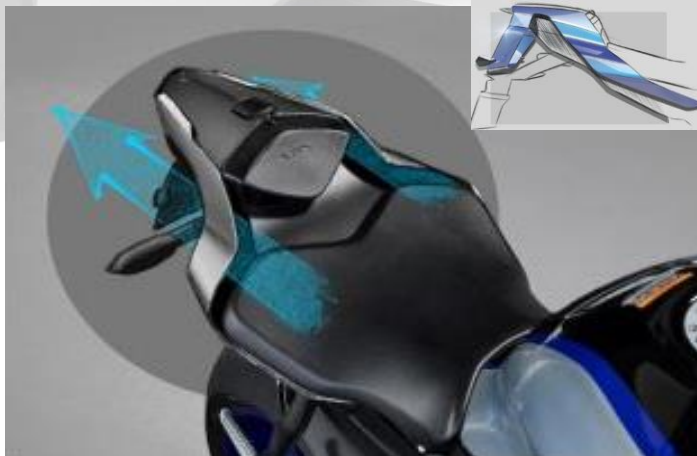
From 2022 Ellea Racing is a new Company Division focused in R&D:

SUPERCAR CONCEPT DESIGN



STYLE RESEARCH
3D CONCEPT DESIGN
3D MODELING
FEASABILITY

AERODYNAMIC DESIGN COMPONENT



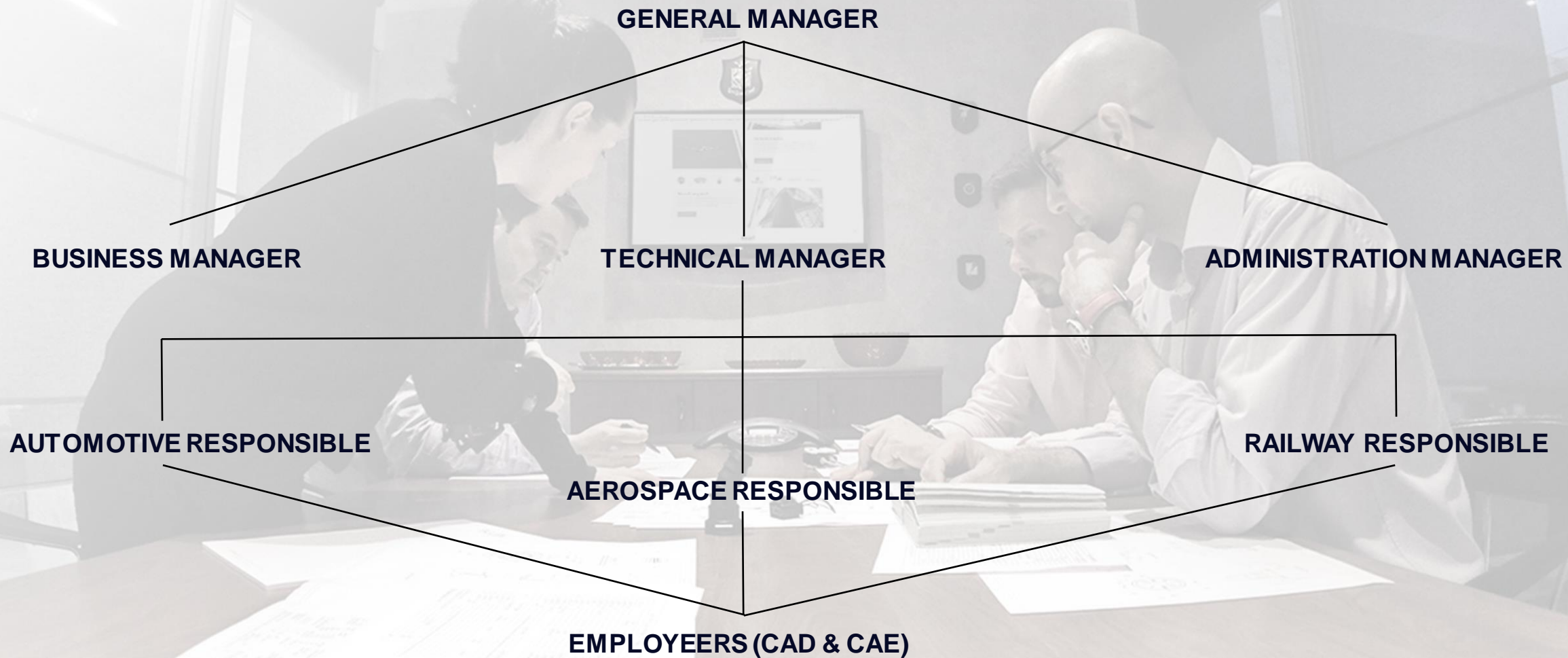
STYLE RESEARCH
3D CONCEPT DESIGN
VALIDATION ANALYSIS
PROTOTYPING & TESTING

ADAS SYSTEMS MOTORBIKE



COMPONENT DESIGN RESEARCH
FIRMWARE & SOFTWARE DESIGN
PROTOTYPING & TESTING

COMPANY CHART



BUSINESS MODEL

INDUSTRY FOCUS

Aerospace, Automotive, Powertrain, Railway

STRATEGY

Market & Product adaptation

Pick Up and Shift

Global Product & Service

Local Resources Execution

Remote Resources Execution

SERVICE

Best in class delivered through

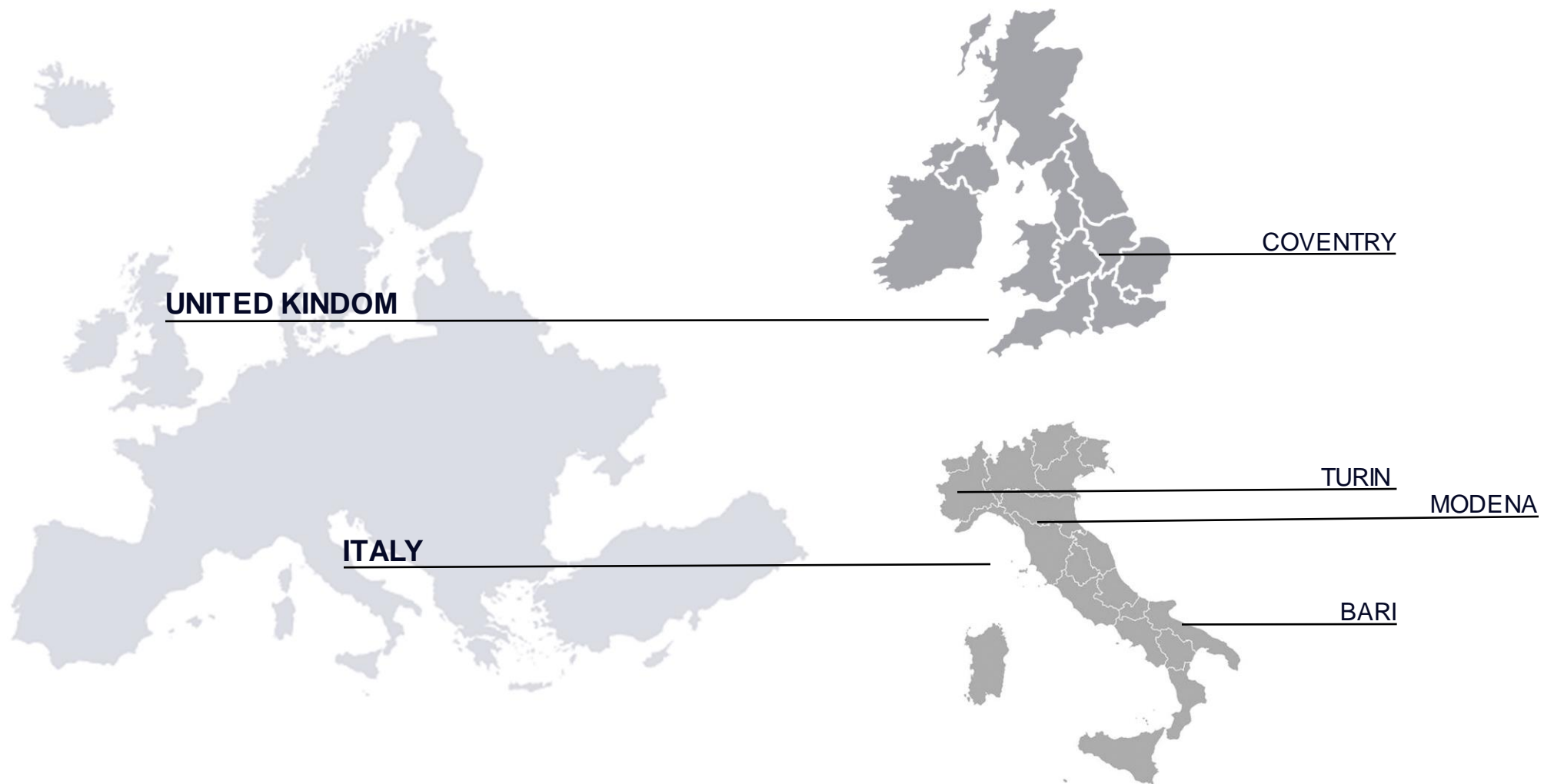
Flexibility

Efficiency

Readiness

Competitiveness

LOCATIONS



A dark, semi-transparent background image of a high-speed train, likely a Shinkansen, moving from left to right. The train is white with blue and grey accents, and the letters 'HS2' are visible on its side.

RAILWAY

CASE HISTORY

AEROSPACE

AUTOMOTIVE

POWERTRAIN

RAILWAY

SUBWAY MENECHINO

- 2006 -

DESIGN

Design for main bogies equipments and subsystems:

- Bolster
- Cow catcher
- Electric & pneumatic implants

FINAL CUSTOMER



NARROW GAUGE TRAIN "CVS" - from 2006 to 2008 -

DESIGN

- Design of complete motor and trailer jacob bogies
- Bogie frame (new concept two half-frames adapted for narrow gauge)
- Anti-derailment device
- Suspensions
- Implants (pneumatic suspension, pneumatic brake, HV & LV electrical)

FINAL CUSTOMER

ALSTOM

HIGH SPEED TRAIN "MCNE"

- from 2007 to 2009 -

DESIGN

Design of complete motor and trailer bogies:

- Bogie frame
- Primary and secondary suspension
- Trailing system
- Implants
- Wheelset
- Active flange lubricating device

FINAL CUSTOMER

ALSTOM

CITY LIGHT TRAMWAY "BURSA"

- from 2010 to 2011 -

DESIGN

Design of complete motor and trailer bogies for low lifting plane tramway:

- Bogie frame
- Primary and secondary suspension
- Implants
- Wheelset

FINAL CUSTOMER

ALSTOM

METRO "KARAJ" - 2011 -

DESIGN

Design of complete motor and trailer bogies for light subway:

- Bogie frame
- Primary and secondary suspension
- Implants
- Wheelset

FINAL CUSTOMER

ALSTOM

PENDOLINO PKP "POLONIA" - 2013 -

DESIGN

Carbody interior/exterior design and installation for:

- Roof Implants
- Air conduits
- Toilets
- Doors & Windows

FINAL CUSTOMER

ALSTOM

PENDOLINO SBB "SVIZZERA" - 2013 -

DESIGN

Carbody interior/exterior design and installation for:

- Roof Implants
- Air conduits
- Toilets
- Doors & Windows

FINAL CUSTOMER

 ALSTOM

EMU CORADIA MERIDIAN

- from 2013 to 2014 -

DESIGN

- Carbody structure and interior/exterior design and installation for
- Roof Implants
- Air conduits
- Tilting system
- Carbody equipments (tanks, batteries box)
- Toilets
- Doors & Windows

FINAL CUSTOMER

ALSTOM

ETR 675 - from 2014 to 2015 -

STRESS

Under body emergency equipment boxes structural verification:

- FE modelling
- Static analysis with geometric and material non linearities for static strength and endurance evaluation according to EN 12663 and EN 1999-1-3
- FE Load extraction and structural verification of bolts and rivets by hand calculation according to the European standard EN 1993-1-8
- Reporting

FINAL CUSTOMER

ALSTOM

HIGHT SPEED TRAIN "HYPERION"

- from 2015 to 2016 -

DESIGN

Design of complete motor and trailer bogies:

- Bogie frame
- Primary and secondary suspension
- Implants
- Wheelset
- Passive flange lubricating device
- Sanding device

FINAL CUSTOMER

SOFTRONIC

POP 2.0

- from 2021 to 2022 -

DESIGN

Carbody interior/exterior design and installation for:

- Roof Implants
- Air conduits
- Toilets
- Doors & Windows

FINAL CUSTOMER

ALSTOM

STA AUSTRIA

- from 2022 to 2023 -

DESIGN

Carbody interior/exterior design and installation for:

- Roof Implants
- Air conduits
- Toilets
- Doors & Windows

FINAL CUSTOMER

ALSTOM

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THANK YOU

ELLEA Ingegneria Srl

www.elleaing.com

<https://www.linkedin.com/company/ellea-ingegneria-srl>



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