



From Ambition to **Intelligent Action**

Aldar Innovation Report 2025

Contents

Aldar Today

- 05** About Aldar
- 06** Aldar's Footprint
- 07** Innovation at Aldar

AI & Data Intelligence

- 13** Market Intelligence Project
- 15** AI-Powered Cybersecurity
- 17** Contilio AI

Signature Experiences

- 20** The Year of Hospitality-Driven Excellence
- 21** The Aldar CX Academy
- 23** The Aldar CX Challenge

Sustainability

- 28** Towards0 Sustainability Platform
- 30** Mrüna
- 32** AMPD

Modern Methods of Construction

- 35** AC3D



Aldar Today



Leading Real Estate into the Future

Ahmed Benrekia

Executive Director of Strategy & Transformation at Aldar

At Aldar, innovation is measured by the lasting impact we make on our communities.

In 2025, we accelerated this ambition in line with our 2030 strategy, which has set a clear direction for the next phase of growth. It is anchored by three pillars: Product Excellence, Signature Experiences, and Capital Management, each playing a distinct role in embedding innovation more deeply into how we design, build, operate, and serve our communities.

Through Product Excellence, we are deploying technology, data, and AI to build smarter, faster, and with greater precision. Through Signature Experiences, we are advancing our hospitality-led approach to deliver seamless, personalised, and memorable interactions across every customer touchpoint. And through disciplined Capital Management, we are ensuring that every investment in innovation is focused,

scalable, and accountable, creating lasting value for our customers, communities, and shareholders.

This progress is only possible because of our people. By fostering a culture of collaboration across teams, startups, and partners, we are continuing to embed innovation into Aldar's DNA and strengthening its role as a long-term engine of growth.

Looking ahead, we are excited by the opportunities shaping the next phase of real estate, from agentic AI and seamless living ecosystems to regenerative infrastructure, climate-positive communities, and AI-enabled planning and construction. These are the building blocks of future-ready communities, and Aldar is committed to bringing them to life responsibly and at scale.

Together, we are engineering the future of living.



About Aldar

Aldar is the leading real estate developer, manager, and investor, with a growing presence across the UAE, the Middle East and North Africa, and Europe. With Abu Dhabi as its home market, Aldar is shaping the city's most iconic destinations—Saadiyat, Yas, Fahid, and Al Maryah Islands. Spanning the full real estate value chain, Aldar delivers lasting social and economic impact in the communities where it operates.

LOCAL PRESENCE



INTERNATIONAL PRESENCE

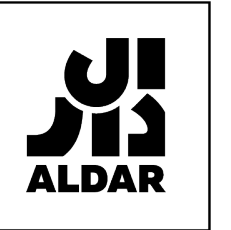


33.8bn

2025 Total Group Revenue (AED)

8.8bn

2025 Total Group Net Profit (AED)



Aldar's Footprint

Aldar's cross-platform model is built on two complementary business lines. Aldar Development is a master developer of integrated, liveable, and thriving communities across Abu Dhabi and the UAE's most desirable destinations, with property sales reaching AED 35.5 billion in 2025. Aldar Investment owns and manages recurring income generating assets, a hospitality portfolio, as well as education and integrated property and facilities management platforms across the UAE, with assets under management reaching AED 49 billion in 2025.

DEVELOPMENT

59.5mn Landbank (SQM)

25.7k Units Under Development

61.0bn Residential Property Backlog (AED)

HOSPITALITY

12 Hotels

8 Beach Clubs/Marinas/
Golf Courses

INVESTMENTS

582k Commercial Leasable Area (SQM)

537k Retail Leasable Area (SQM)

921k Residential Leasable Area (SQM)

525k Industrial & Logistics Leasable Area (SQM)

COMMUNITIES

945mn Facility Management Total Orderbook (AED)

155k Residential Units Managed

1.3bn Integrated Services Total Orderbook (AED)

EDUCATION

27 Schools (Operated & Managed)

36k Students

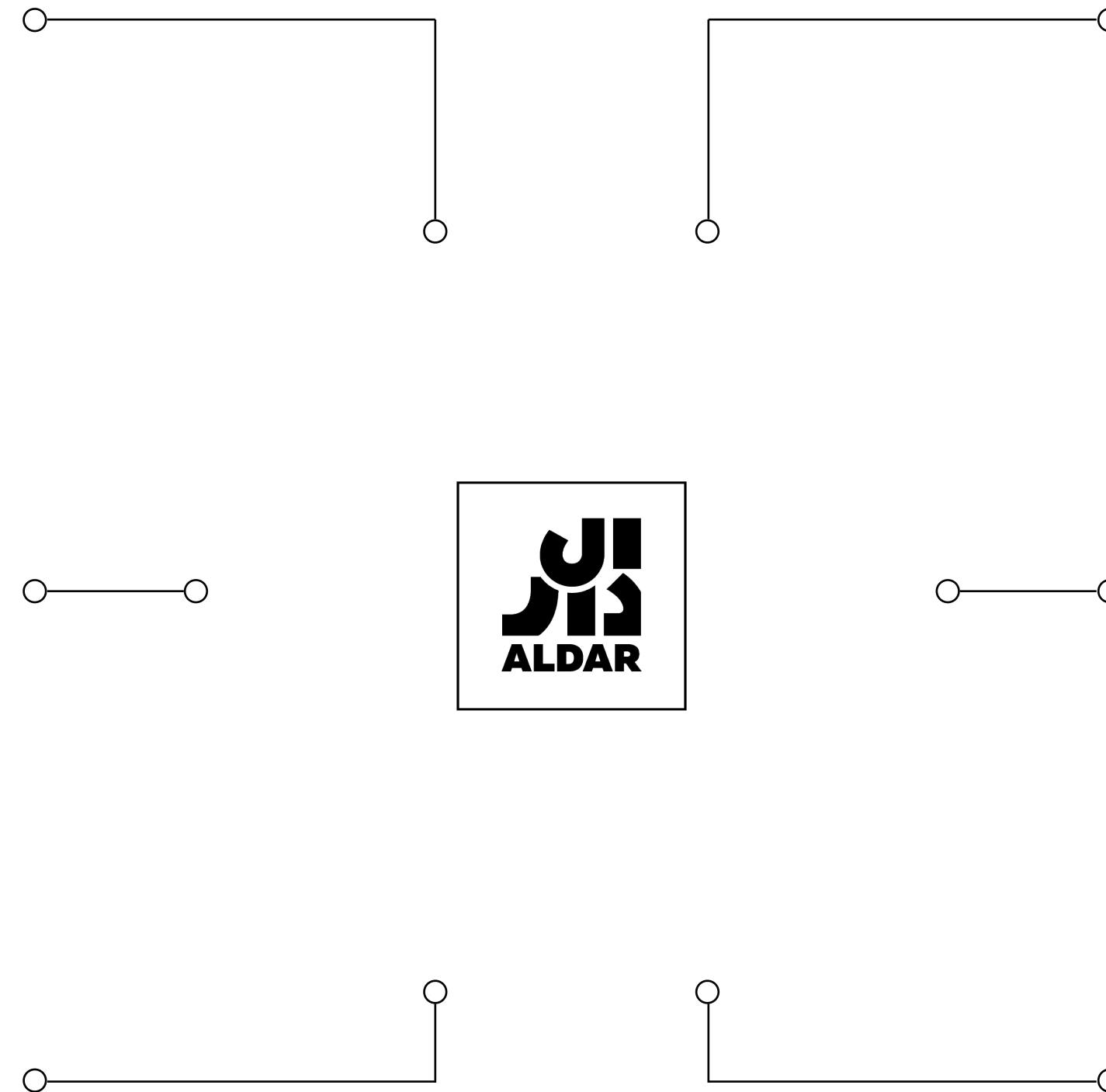
INFRASTRUCTURE

29k Villas in 40 Locations

440km of Cycle Tracks

1,709km of Road Development

545 Community Facilities in 70 Locations



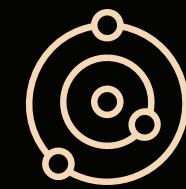


Innovation at **Aldar**

Aldar is building the most intelligent real estate platform in the region, deploying technology, data, and AI as a strategic mandate in line with its innovation priorities.

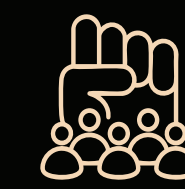


Delivering Innovation



Global Scouting & Piloting

Aldar's external innovation engine, tapping into our global innovation ecosystem and leveraging multiple VC funds to systematically source, test, and scale cutting-edge solutions for smarter, sustainable urban development.



Innovating Within

High-impact transformation programmes that engage Aldar's employees, leadership, and broader community to identify challenges and develop the solutions to solve them, ensuring innovation is continuously lived across Aldar.



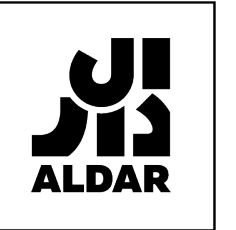
Research & Strategy

Continuous research and market intelligence that track emerging technologies, industry trends, and evolving customer needs, enabling Aldar to identify high-impact opportunities and inform strategic innovation priorities.



Networking & Partnerships

A dynamic ecosystem of strategic partnerships with startups, technology leaders, government entities, industry stakeholders, and more, fostering collaboration, accelerating innovation adoption, and unlocking new sources of value across Aldar's portfolio.



Innovation Ecosystem

Venture Capital



Governments & Corporates



Ecosystem Enablers





Partnership Highlights

SIEMENS

Smart Urban Living at Saadiyat Grove

In partnership with Siemens, Aldar deployed the UAE's first cloud-based, AI-powered district management system across Saadiyat Grove.

 **Technology**

- Advanced energy analytics
- IoT sensors monitoring
- AI-driven analytics
- Digital twins

 **Impact**

- Streamlines asset management.
- Reduces emissions.
- Ensures personalised, eco-conscious living.
- Optimises performance for commercial tenants.

VISA

Voice-Enabled Agentic Payment Experience

In partnership with Visa, Aldar launched the UAE's first voice-enabled agentic payment of service charges through Aldar's AI agent.

 **Technology**

- Visa Intelligent Commerce Suite
- Natural Language Processing (NLP)
- AI Agent integration
- End-to-end encryption

 **Impact**

- Streamlines secure transactions.
- Enables a simplified payment flow.
- Ensures a process completed in seconds.
- Offers a customer-first Signature Experience.



AI-Powered Cashless Parking Solution

Through a joint venture with Parkonic, Aldar Estates deployed a cashless, AI-powered parking OS designed to manage 200k+ spaces.

 **Technology**

- Smart mobility operating system
- AI-powered license-plate recognition
- Integrated touchpoints
- Real-time parking insights

 **Impact**

- Standardises the parking experience.
- Enables coordination and predictability.
- Reduces congestion.
- Sets up a scalable infrastructure.



Aldar's Innovation Priorities

1

AI & Data Intelligence

Advance innovation through AI and data to transform decision-making, optimise asset performance, and enable predictive, personalised experiences across Aldar's developments, operations, and customer journeys.

2

Signature Experiences

Innovate customer-centric experiences by designing differentiated destinations that elevate how people live, work, and connect, creating engaging, seamless, and memorable interactions across Aldar's communities.

3

Sustainability

Position Aldar as a global benchmark in sustainability innovation by adopting and scaling transformative solutions across design, construction, and operations to deliver low-carbon, resource-efficient communities.

4

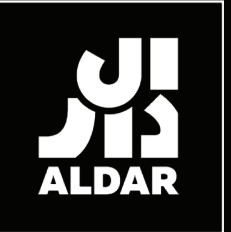
Modern Methods of Construction

Pioneer innovation in construction through advanced technologies and methodologies that accelerate delivery, enhance quality and safety, and reduce costs and environmental impact across projects.

AI & Data Intelligence

Market Intelligence Project

Aldar leveraged embedded AI expertise to transform market data into actionable insights, optimising assets, customer experiences, and revenue opportunities across its portfolio.



Unlocking Intelligence from the Market

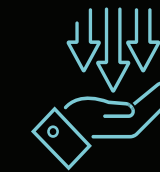
For several months, Aldar embedded AI and geospatial specialists within our Innovation and Strategy team. By applying advanced analytics on large-scale internal and external datasets, they uncovered behavioural patterns and market trends, delivering high-value cross-sector intelligence.

The initiative unlocked revenue opportunities, optimised operations, and enhanced customer experiences, directly supporting our growth and efficiency objectives across the emirate.



Technology

- AI-driven geospatial mobility modelling powered by PerigonAI Big Data Lake
- Transaction trend analysis via PerigonAI ML & AI Engine
- Predictive asset utilisation scoring using PerigonAI ML & AI Engine



Impact

- Helped core business units identify new opportunities to enhance Aldar's portfolio and introduce competitive products and services.
- Maximised revenue through targeted insights on visitation patterns, trade areas, and spending behaviour.
- Refined and uplifted existing offerings guided by data-led case-specific interventions.
- Optimised and maximised asset utilisation through precise user behaviour.
- Increased cross-visitation between assets.
- Enhanced operational and customer experience outcomes within our portfolio and beyond.

Population & Migration

Retail

Entertainment

Education

Expenditures

Hospitality

Residential

Events

36mn

unique mobile devices (domestic & int.)

331.5bn

location events (domestic & int.)

7.1bn

credit card transactions analysed

2,500+

satellite images analysed

AI-Powered **Cybersecurity**

AI empowers Aldar's cybersecurity teams to proactively protect people, assets, and data, combining human expertise with intelligent automation at scale.



Leveraging Intelligence for Protection

Aldar implemented an AI-enabled security operating model designed to match the spread and scale of the evolving threat landscape, which has been escalating in both scale and complexity, driven by the rapid adoption of AI by threat actors and the commercialisation of cybercrime through readily available attack services.

34,000+

operational hours automated

AED 5.7mn+

cost avoided



Solution

By integrating AI directly into daily security operations, Aldar strengthened its ability to detect, assess, and respond to threats at scale, without increasing headcount. AI did not replace human expertise; it amplified it.



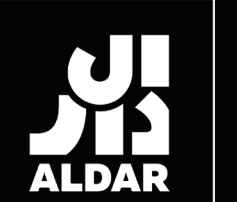
Technology

- Email Security AI Agent
- Incident Detect and Response AI Agent
- Security Investigation AI Agent
- Third-party Security AI Agent



Impact

- Reduced manual and analyst workload by automating security assessments, investigations, and triage.
- Improved productivity and cost efficiency by augmenting security teams with AI capabilities.
- Accelerated threat detection and response times, reducing investigation cycles from hours to minutes.
- Enabled faster, more consistent security decisions across multiple security workflows.
- Enhanced operational focus and resilience by filtering false alerts and prioritising genuine threats.



Contilio AI: AI-Driven Smart Construction

Contilio AI's advanced construction intelligence platform leverages AI-powered 3D analysis and digital twin technology to monitor site progress and quality in real time. The solution automatically generates accurate as-built models and actionable insights.

20-30%

savings in man-hours

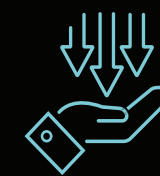
\$20-30mn

savings in delay and
rework costs



Technology

- 3D reality capture (LiDAR, photogrammetry, 360° images) of construction sites
- AI/ML algorithms for progress tracking, quality control, and risk detection
- Digital twin generation for live, actionable project models
- Predictive analytics for rework, delays, and cost optimisation
- Data dashboards for real-time stakeholder insights and decision-making



Impact

- Reduces rework and material waste through AI-powered progress tracking and construction verification.
- Improves project visibility with real-time, data-driven insights from site imagery and scans.
- Enhances efficiency by automating manual site inspections and reporting processes.
- Supports more accurate project delivery through continuous monitoring of construction progress.
- Accelerates decision-making and handover by identifying risks, delays, and quality issues downstream.



Zara Riahi

Co-Founder & CEO of Contilio AI

Could you explain what Contilio does and how AI and machine learning enable your technology?

Contilio acts as an AI intelligence layer for the construction industry, connecting design with execution. We provide real-time, actionable insights to decision-makers and stakeholders, helping them stay ahead of errors and delays. Our “physical AI” platform uses 3D AI and computer vision to recognise and categorise site elements from raw data, such as LiDAR scans. It then automatically compares this “as-built” reality against the BIM design and schedule, using machine learning to draw insights and update construction digital twins within hours.

You mentioned “physical AI.” What exactly does that mean in this context?

Traditional AI often focuses on digital data. Physical AI, a term used by companies like Nvidia, refers to complex systems that can understand and help manage the physical world. Construction involves building complex engineering systems with millimetre accuracy. Physical AI allows us to understand these complex environments while adhering to physical constraints.

How do you collect and manage these massive amounts of data, and how do you turn that into actionable insights?

We use LiDAR scanners to collect millimetre-accurate, walkable 360°, and 3D maps of construction sites. Our AI platform reduces this data volume by up to 20 times by removing non-construction elements like equipment or scaffolding.

Much like an autonomous driving system, our AI segments and recognises every element visually. By comparing this to the plan, we can determine the exact percentage of completion and identify specific quality errors. These insights are continuously updated and remain available for the operations team after handover.

What are the primary benefits for a developer like Aldar?

The benefits are multifold. Instead of an army of people manually spot-checking sites, our platform analyses millions of elements in hours, allowing for major efficiency gains. By verifying quality and catching errors in near real time, we also reduce rework, costs, and even CO² emissions. In addition, we help enhance transparency and customer satisfaction by providing accurate production rates and timelines based on data rather than guessing. Lastly, by knowing exactly how much work is done per package, developers can certify payments more efficiently.

How does working with Aldar impact your technical roadmap?

Aldar builds mega-developments. This pushed us to upgrade our system to handle virtually unlimited BIM elements. We continuously collect feedback from them and other partners to prioritise new functionalities.

What is the next step for Contilio?

We are expanding our intelligent digital twins into the operations phase. We are also using platform insights to help customers accurately measure and manage CO² during construction, which can facilitate access to green loans. Finally, we are focusing on complex infrastructure like data centres.

Signature **Experiences**



The Year of Hospitality-Driven Excellence

In 2025, Aldar ushered in a new era of customer experience, elevating its approach from customer-centricity to hospitality-driven engagement, powered by authentic Emirati hospitality and distinctive Signature Experiences.

Aldar 2030 Strategy

To become the regional real estate champion that creates Signature Experiences for our customers and sustainable value for our shareholders.

Aldar's Customer Promise

At Aldar, heartfelt hospitality is our signature. We embrace every customer with extraordinary care, meticulous attention to detail, and true Emirati warmth, creating meaningful moments that resonate forever.

Aldar's Hospitality Pillars

Pursuing perfection in every detail.

Anticipating every need with care.

Valuing relationships over transactions.

Making important moments magical.

Inviting everyone to feel they belong.

Key 2025 Milestones

January

- Aldar 2030 Strategy unveiled
- Will Guidara's Unreasonable Hospitality keynote

March – June

- Les Roches and EHL partnership
- Aldar CX Academy programmes designed and launched

February

- 60 senior leaders trained by Will Guidara
- 1,000 colleagues honouring 40 CX Champions
- 5,000+ brokers and partners attending Will Guidara's keynote speech

December

- Lease at Yas Island signed for the dedicated CX Academy facility
- 250 trainees per day capacity
- State-of-the-art tools and immersive environments

Aldar's CX **Academy**

Aldar's CX Academy connects to Abu Dhabi's emirate-wide service excellence ambition and broader vision to deliver world-class, consistent service standards across all touchpoints for its visitors and residents.



Building a Customer-First Culture from Within

Developed in partnership with Les Roches and EHL, two of the world's top hospitality schools, the CX Academy equips Aldar teams across communities, retail, hospitality, and education, as well as third-party partners such as hotels, sales brokers, and tenant staff, to consistently deliver Signature Experiences.

More than training programmes, it drives a mindset shift, embedding heartfelt hospitality into everyday interactions and establishing a shared standard of excellence across Aldar.



Targeted Training Programmes

The CX Academy delivers two tiers of training: a foundational programme for all employees and a suite of specialised programmes for specific roles and customer touchpoints. A third category addressing executives and third-party partners is currently under design.

GRACE — Foundational

Designed for all employees across the Group, GRACE is an 8-hour, in-person programme built around four modules and delivered through task simulations and real-world scenarios.

- Emirati Heritage & Sand'a
- Aldar's Standards & 5 Pillars
- Inclusive & POD Experience
- Aldar Signature Experiences Overview

CORE — Specialised Programmes

Targeting specific roles and customer journey stages, the CORE suite delivers interactive workshops, simulations, field training, and role shadowing across three tracks (8-16 hours per track).

Communities

For facility management, property management, landscapers, security, and concierge: 7-module journey from Pre-Orientation through Move Out

Retail

For retailers, security, and concierge (B2B & B2C): Signature Guest Experience, Luxury Home Design Studio, Resident Retail Reward Pack, and Luxury Send-off

Education

For front desk, counsellors, and teaching staff: Personalised School Welcome Kit, Parent Matchmaker & Concierge, Diversity & Inclusion In Practice, and Welcome Week Celebrations

Impact

~8,000

direct and indirect employees trained

~250

sessions delivered

~19%

yoy increase in Group NPS

100%

yoy increase in Community Management NPS

An aerial photograph of a modern cityscape, likely Dubai, featuring a large body of water, a sandy beach, palm trees, and several modern buildings. A boat is visible on the water in the lower right. The image has a warm, orange-tinted overlay.

Aldar's CX **Challenge**

Aldar's CX Challenge is an ideation programme that empowers Aldar teams to create distinctive, memorable experiences, fostering a customer-first culture and redefining engagement across the portfolio.



Harnessing Ideas, Creating Signature Experiences

Aldar's CX Challenge catalyses the creation of Signature Experiences that leverage cutting-edge technologies, redesigned processes, and impactful enhancements. By rethinking how we deliver moments across the customer journey, the programme deepens customer loyalty, unlocks new sources of value, and positions Aldar as the regional benchmark for customer-first excellence.

Key Objectives



Elevate Signature Moments Across Journeys

Design distinctive, memorable experiences that transform everyday interactions into Signature Experiences.



Strengthen the "One Aldar" Ecosystem

Develop cross-cutting experiences that connect business lines, enable cross-selling, and deliver a seamless Aldar customer journey.



Embed Customer-First Thinking

Foster a culture where every business line designs and delivers Signature Experiences with the customer at the centre.

Process

Submission

270 ideas reviewed

Selection

20 ideas prioritised for Wave 1 release

CX Monitor

Ongoing implementation, continuous measurement of customer adoption, satisfaction, and operational performance

Validation

30 ideas shortlisted and assessed for feasibility

Phased Launch

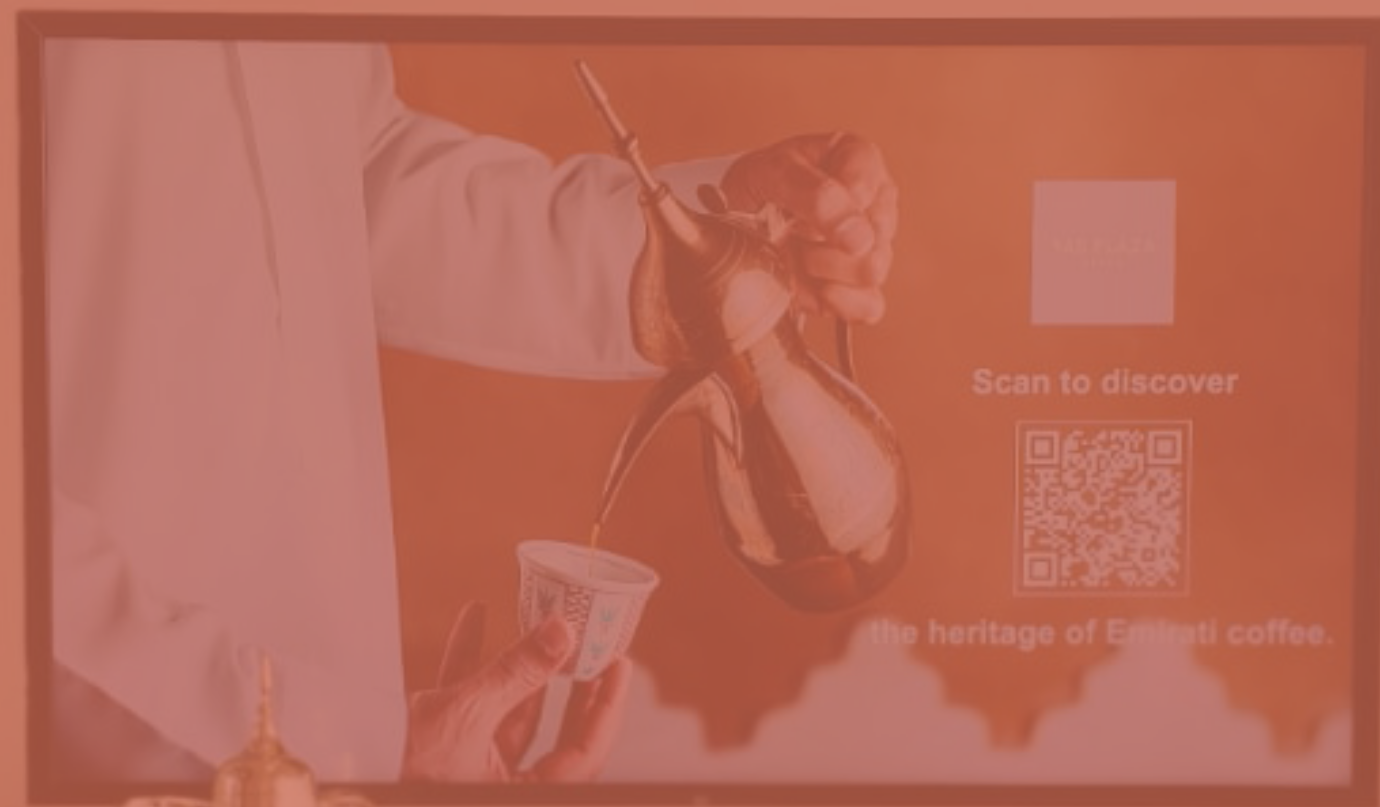
Wave 1 goes live



Use Case Highlight

Sanā' Welcome

Every arrival at an Aldar hotel immerses guests in authentic Emirati hospitality, inspired by the traditions of Sanā'. Visitors are greeted with *Gahwa wa Tamr*, aromatic Arabic coffee served from a classic *dallah*, accompanied by fresh dates.



مركز التسوق

Customer Value

Sense of Belonging

Authentically connects guests with the hospitality and generous spirit of the UAE.

Memorable First Impression

Transforms a routine check-in into a standout experience demonstrating care and value.

Business Impact

Brand Differentiation

Ensures a unique positioning for Aldar hotels by embedding local heritage into the arrival journey.

Enhanced Guest Loyalty & Advocacy

Creates a stronger emotional connection, increasing repeat stays and positive word of mouth.

Operational Consistency

Offers an easy-to-implement, codified, and scalable greeting and service ritual requiring minimal investment.

Deployment

Introduced the full *Gahwa wa Tamr* ritual across all hotel and beach club locations.



Use Case Highlight

Tech Recycling: AI for Onsite Waste Segregation & Robotic Arm for Tech Sorting

Aldar upgraded its Cycled smart recycling station to collect electronics in addition to plastic and glass. Residents are rewarded with loyalty points, while usable devices are repurposed to support families and students in need, giving electronics a second life and reducing e-waste.

Recycle



Metal Cans



Mixed Plastics

Donate



Electronics

Customer Value

Rewarding Sustainability

Turns environmentally responsible behaviour into tangible benefits through loyalty points.

Simplified Recycling

Makes electronics disposal easy and accessible through smart kiosks with clear user guidance.

Community Pride

Encourages residents to contribute to a greener community while supporting socially impactful initiatives.

Business Impact

Sustainability Leadership

Strengthens Aldar's ESG positioning and reputation as a pioneer in community-driven sustainability.

Operational Efficiency

Streamlines electronic waste collection through a standardised recycling approach.

Deployment

Pilot launched at Al Ghadeer, where collected devices are channelled into the UAE's Donate Your Own Device (DYOD) initiative.

Sustainability

A background image of a modern residential park with children playing. A girl in a colorful helmet is roller skating in the foreground, holding a checkered flag. Other children are roller skating and playing in the background. The scene is set in a paved area with trees and modern buildings in the distance.

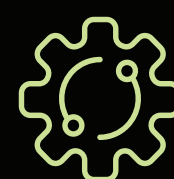
Towards0 Sustainability Platform

In 2025, Aldar accelerated its digital innovation agenda with the Towards0 Sustainability Platform, a scalable, AI-ready foundation for enterprise-wide ESG and Net Zero transformation.



End-to-End Digitalisation of ESG Data Collection

Towards0 replaces fragmented sustainability reporting with a unified, AI-first platform, strengthening governance, expanding KPI coverage, and enabling data-driven ESG performance management across Aldar.



Technology

- ESG and Net Zero data management architecture
- Automated dashboards and system-driven regulatory reporting
- RA Copilot (beta), an AI-powered ESG insights chatbot
- RPA-enabled utility invoice ingestion



Impact

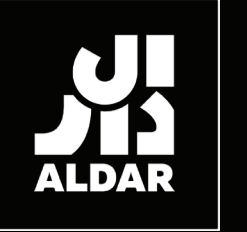
- Unified fragmented, manual processes into a single, auditable, and future-proof source of truth for sustainability data at scale.
- Eliminated Excel-based ESG reporting, enhancing data accuracy, accessibility, governance, and accelerating insight-driven decision-making.
- Embedded digital sustainability capabilities across functions, minimising dependency risks and strengthening SBTi and UAE regulatory readiness.

513

metrics, up from 52

~200

assets and all subsidiaries covered



Mrüna: Sustainable Wastewater Solution

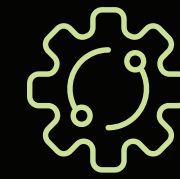
Mrüna provides a nature-based wastewater recycling solution that enables sustainable on-site treatment as well as remote monitoring and control. Aldar has been implementing Mrüna's circular systems on a growing number of construction site operations since early 2023.

3,120m²

of green space
planted in 2025

55mn+

litres of water
recycled in 2025



Technology

- Nature-based biological treatment systems for wastewater purification (BiomWeb)
- IoT sensors for real-time monitoring of water quality and system health
- Remote automation for operational control and maintenance alerts
- Data analytics for sustainability metrics and performance reporting
- Digital twin integration (emerging) for system optimisation and planning



Impact

- Enabled water reuse for irrigation, dust suppression, toilet flushing, and more.
- Eliminated reliance on sewage tankers, supporting decentralised wastewater treatment.
- Removed trucks from the road, lowering traffic congestion, operational logistics, and associated carbon emissions.
- Reduced the overall environmental footprint by lowering freshwater demand and energy-intensive transport.
- Supported greener communities with expanded landscaped areas and green public spaces.



Ziad Hussami, CEO of Mrüna

How do tech advancements support Mrüna's goal of blending nature-based systems with IoT and digital monitoring?

Our vision involves moving away from relying on inherited, standardised infrastructure specifications from water-rich countries like the UK to an approach that maximises water reuse and promotes a circular model suitable for a desert climate. AI makes it easier to create generative design scenarios and iterate designs, potentially enabling the modeling of complicated nature-based solutions like biological treatment using the roots of a plant.

Can you explain how BiomWeb generates data, and how this data is used today to optimise treatment outcomes?

Our centralised online platform manages a decentralised network of systems to collect data on the amount of water treated on each site. Our pumps and sensors measure water consumption, we estimate truck trip savings, and calculate greenhouse gas emissions. This data allows us to track system volume and capacity, determine if expansion is needed, and report back to the customer's sustainability team.

When working with large developers, how important is data transparency in building trust?

It depends on each stakeholder. Aldar needs data to demonstrate the effectiveness of their sustainability initiatives. Contractors also require clarity to verify payments and report back to Aldar, allowing them to focus on building rather than paperwork. For Mrüna, the data is operationally crucial for understanding system performance, such as detecting pump failure or unexpected wastewater volumes.

What impact do you foresee for AI on wastewater management and the industry more broadly?

Current AI use is focused on optimisation and simplification rather than fundamentally "reimagining" the construction of sewer networks or city design around water, but the industry needs a radical rethink, and generative design using AI could facilitate this reimagination.

AI could also play a role in replacing reliance on traditional standards and codes with new, more flexible standards that suit the local needs of the UAE and the region.

What are the next steps for Mrüna from a technological standpoint?

We are developing an MVP application that will compare traditional infrastructure against our nature-based approach, serving as a business case tool to quantify value across multiple parameters, including time to construct, embodied carbon, operational costs, and water recycling. The acceleration of AI technology, which enables this comparison tool to be built much faster than previously possible using Geographic Information Systems (GIS), makes the project viable now.

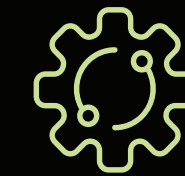


AMPD: Energy Storage Solution

AMPD Energy develops advanced battery energy storage systems that significantly reduce the reliance on large diesel generators on construction and industrial sites. These solutions lower emissions, noise, and operational costs while enabling smart, connected, sustainable power solutions.

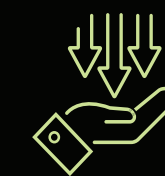
42.3k
litres of fuel saved

92.3%
yoy growth in fuel savings



Technology

- Modular battery energy storage systems
- Smart energy management software for load balancing and optimisation
- Remote monitoring and predictive analytics for uptime and performance
- IoT-enabled sensors for fuel consumption, emissions, and power usage
- AI for predictive energy dispatch and demand forecasting



Impact

- Reduces CO² emissions by replacing large diesel generators with low-emission battery energy storage systems.
- Cuts diesel fuel consumption by optimising generator usage and reducing runtime on construction sites.
- Improves energy efficiency through smart battery storage and real-time power management.
- Reduces noise pollution, creating quieter and safer working environments.
- Supports more sustainable, cost-effective, and lower-impact construction operations.



Brandon Ng, Co-Founder & Chair of AMPD

Can you walk us through AMPD's technology and its differentiators?

AMPD builds and deploys lithium-ion mobile batteries for heavy industries, starting with the construction sector six years ago. Unlike traditional diesel generators, our batteries eliminate fossil fuel combustion, significantly reducing carbon emissions, air pollution, and operational complexity. They also require less maintenance and lower on-site intervention, making them cleaner and more efficient alternatives to diesel-powered systems.

How do you quantify and report emissions and operational efficiencies for projects like those with Aldar?

Our products do not directly produce emissions, but they must be recharged, often using non-zero carbon energy. Yet, we still achieve an overall carbon footprint reduction of 40% to 95%.

We quantify this through our integrated technology stack. Our products monitor power delivery every second and upload the data to a secure cloud system. There, we simulate a digital twin of a diesel generator to calculate the avoided fuel consumption and carbon production. From that, we subtract the emissions associated with recharging to determine net savings.

Beyond carbon reduction, the same real-time data enables operational insights. Customers can monitor equipment usage, identify underutilised or malfunctioning machines, and take corrective action.

Other operational gains come from reduced maintenance, lower noise levels, and eliminating fuel transport logistics.

As construction becomes more digitised, how does real-time energy data change developers' power usage and efficiency?

Its importance depends on the organisation's priorities. For companies like Aldar that actively invest in innovation and sustainability, real-time data is essential to quantify ROI and track impact.

However, even companies less focused on ESG adopt AMPD because the economics make sense.

How do you see AI enhancing decision-making on-site?

We have been leveraging our vast data to build a strong data and AI team, which is now working on predictive capabilities to address reliability problems before they occur, even when the issues are related to customer usage. Our new AI engine suggests proactive actions for sites, distributors, or service teams. It takes the guesswork out of diagnosing.

How do you see the role of your energy storage solutions playing out in the future?

In Hong Kong, AMPD now powers over 60% of the construction industry, which relied entirely on diesel six years ago. We aim for similar adoption levels in our other markets.

Our next-generation products will also enable expansion into mining, concrete manufacturing, and oil and gas, advancing our vision of an emission-free future across heavy industries, which account for 5% to 15% of global carbon emissions.

Modern Methods of **Construction**



AC3D: 3D-Printed Gate Houses

AC3D delivers automated 3D construction printing technology that transforms how buildings are designed and built, enabling faster delivery, lower costs, reduced emissions, and scalable, data-driven construction across global markets.

2

fully 3D-printed
gate houses

53%

savings in
man-hours



Technology

- Automated 3D printing hardware for construction
- Robotics and control software for precision printing
- AI-driven print path optimisation and material mixing
- Sensors for quality assurance, structural integrity, and environmental conditions



Impact

- Reduces material waste through precise 3D fabrication and optimised resource usage.
- Accelerates construction timelines with rapid, layer-by-layer building methods.
- Improves efficiency by automating complex construction processes.
- Lowers manpower needs, enhancing safety and reducing labour costs.
- Supports sustainable, cost-effective, and innovative project delivery.



Boris Kozlov, Founder of AC3D

Can you describe AC3D's technology and how it integrates hardware, materials, and software?

Construction 3D printing is an additive manufacturing process that blends hardware, specialised printing materials, and software. Our vertically integrated technology stack allows for a seamless, continuous digital process from design to production, unlike traditional construction which transitions from digital models to analog manual processes. Specialised materials include concrete adjusted for greater strength, higher sustainability, and faster curing, along with geopolymers, a cementless concrete type that significantly reduces CO² emissions.

What are the benefits and how is it transforming construction?

Benefits include up to 70% fewer workers on site, faster timelines, repeatable quality control, less material waste, and the elimination of formwork. Other advantages include enhanced construction site safety, the ability to produce complex geometries at no extra cost, and increased sustainability.

3D printing is also more cost-effective due to savings on formworks, labor, and materials. These savings can reach up to 20% in the UAE, depending on the project specs. They will increase as the technology improves, 3D printing materials become cheaper, and deeper automation is achieved.

How do you collect and use data?

Data collection is inherent and automatic in digital production, with all printing data logged and stored, which is used to improve our printers, analyse errors, and refine digital code for printer trajectories. Data points collected include

environmental factors like temperature, humidity, and wind speed, which will eventually be utilised for an AI agent to control the machines.

Where do you see new technologies such as robotics and AI going?

Our AI agent is a key technological vector, aiming to reduce the number of workers needed to control potentially hundreds of printers in the field by enabling the machines to make decisions on quality, emergencies, and safety. Currently, we are teaching it to detect and autonomously correct imperfections in printed layers, mimicking human operator decisions.

In terms of hardware and robotics, we are developing the big gantry on-site robot to function as a Swiss army knife with multiple tools for tasks like rebar installation, foundation work, plastering, and roof panel installation, aiming for up to 80% automation of the building skeleton.

How does working with established developers such as Aldar influence AC3D's technology roadmap?

Working with Aldar, a leading developer with large-scale projects, significantly influences our technological roadmap. Aldar sets high standards for compliance, permitting, and scalability, pushing our company toward multi-printer site automation and integration with various enterprise systems. This relationship is transitioning us from being a "technology showcase" to a provider of "deployable infrastructure."

Looking ahead, do you imagine a future where buildings are largely designed, optimised, and constructed by AI-assisted systems?

AI is already transforming construction by handling design optimisation, simulation, scheduling, and quality control, shifting human roles toward supervision. We believe that future construction sites will resemble robotic factories, leading to more sustainable, economical, time-efficient, and energy-efficient construction techniques and buildings for humanity.



What's Next

Engineering the Future of Living

The next decade of real estate will not be defined by building alone, but by intelligent, integrated living systems. Aldar is positioned at the intersection of AI, sustainability science, and urban design, advancing the technologies, materials, and ecosystems that will shape future-ready communities.

Agentic AI

Autonomous AI agents managing end-to-end asset lifecycles, from maintenance to pricing and resident services, enhancing efficiency and responsiveness with minimal human oversight.

Climate-Positive Communities

Buildings that go beyond Net Zero, acting as carbon sinks through the integration of sequestering materials such as biochar, living facades, and urban forests into the built environment.

Seamless Living Ecosystems

A unified community platform connecting identity, mobility, payments, home automation, and services across every touchpoint of daily life.

Physical AI & Robotics

Construction sites operating as robotic factories, where autonomous construction systems and AI-driven supervision build entire structures with greater speed and precision, while reducing labour.

Regenerative Infrastructure

Nature-based systems that restore biodiversity and regenerate soil in arid landscapes, enabling more sustainable resource use and turning development into an ecological net positive.

Generative Urban Intelligence

AI-enabled master planning tools that simulate climate, energy, and social dynamics in real time to design more adaptive, high-performing communities.

Work With Us

Contact us:
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Or explore:
www.aldar.com/en/about-us/innovation