



Introduction InControl EMAAR EEG Entertainment

EMAAR

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In close cooperation with Mijksenaar





INCONTROL

Agenda

InControl*: simulation, portfolio, customers and business partners

➤ Dubai site visit: focus points and observations

Example SkiDubai

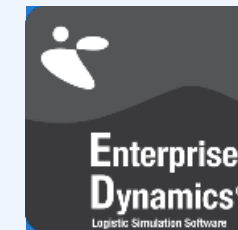
*) Mijksenaar, see separate PPT-deck

InControl in short

- Established in The Netherlands in 1989
- Private owned WW activities: www.InControlsim.com
- X-industry simulation solutions
- Offices in NL, GER, USA and Japan
- 3 simulation products:
 - 1 Simulation platform including enabling e.g.:
 - Enterprise Dynamics: Discrete event simulation software
 - Pedestrian Dynamics: Continuous simulation software

Proof points

- Long lasting relationships
- Growing contract terms & value
- Customers = References
- Industry and Scientific Recognition
- Ecosystem, Business Partnership Model



Platform



Mission Statement

Deliver software solutions contributing to a safe and sustainable planet

InControl Enterprise Dynamics

InControl is a worldwide leading manufacturer of simulation and emulation software for the safety and sustainability of critical infrastructures.

Our success is driven by our clients and Business Partners.



Our Themes



We Create

Industry

- › Supply Chains
- › Production factories
- › Manufacturing
- › Material handling



We Move

Logistics

- › Supply Chains
- › Warehousing
- › Freight handling



We Travel

Public Transportation

- › Total airport management
- › Harbours
- › Rail, metro, buses
- › Multi modal transportation hubs



We Enjoy

Crowded places

- › Stadiums and Arenas
- › Events
- › Experience Centres
- › Museums
- › Amusement parks



We Live

Urban development

- › Metropole areas
- › Entire city quarters

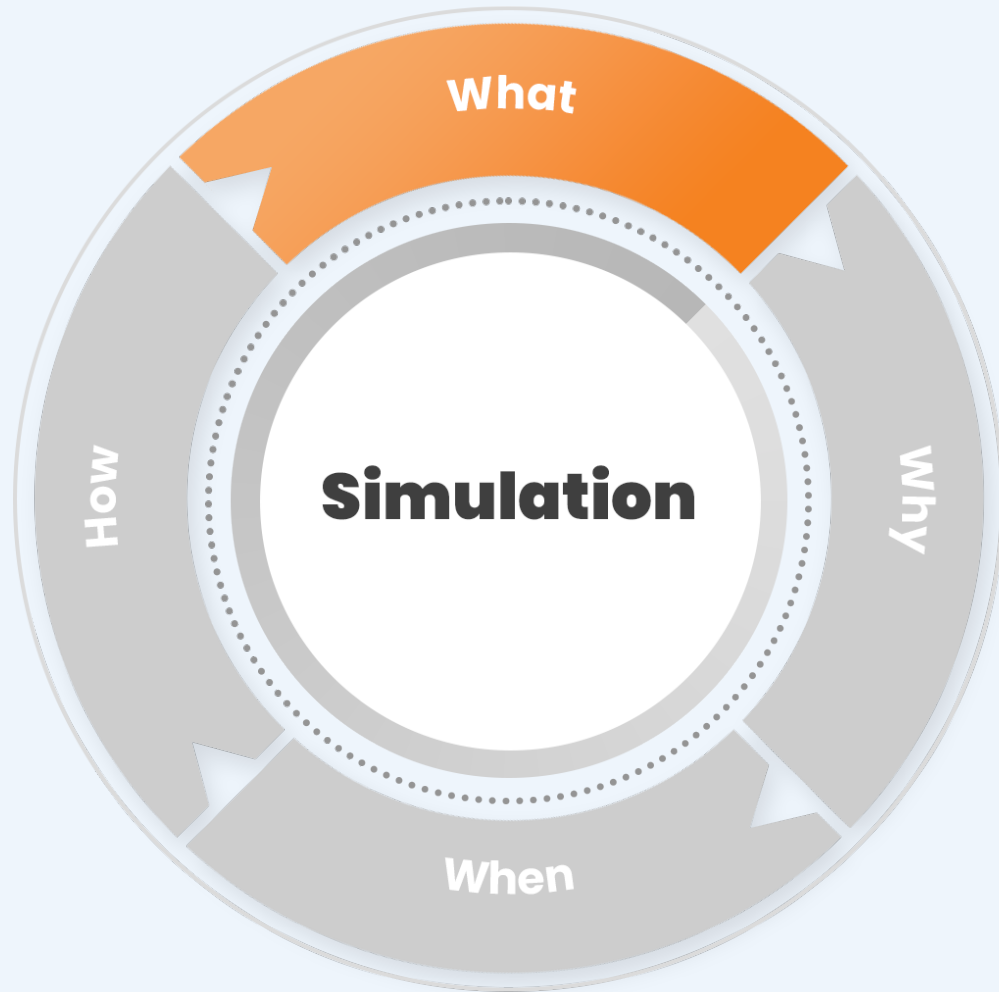


We Learn

Education

- › Universities
- › Applied sciences
- › Research & Development Institutes

Why Simulation?



What is simulation?

"Simulation is the art and science of creating a representation of a process or system for the purpose of experimentation and evaluation".

Why Simulation?



Why should you use simulation?

- Prediction
- Enhance safety and security
- Testing alternatives
- Analyses:
 - *What-if*
 - Impact
 - Risks and Risk-mitigation
- Optimize
- Powerful communication aid
- Control
- Save on time and cost

Why Simulation?



When should you use Simulation?

- Analytical approaches are not suitable
 - Stochastic process
 - Too dynamic
 - High complexity
- Real-life experiments are not an option
 - System does not yet exist
 - High risks, costs, and time needed

Why Simulation?



How to do simulations of Supply Chain and Crowded Places?

Supply Chain:

- Enterprise Dynamics®
- Each element (*atom*) simulated on 3 levels
- Complete railway infra, BHS, Manufacturing, Logistics

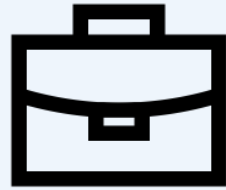
Crowded Places

- Pedestrian Dynamics®
- Each pedestrian (*agent*) has a specific profile
- Interaction between pedestrians, traffic and the infrastructure & services

Our services



Software & Licenses



Projects & Implementations



Training



Support & Maintenance

Enterprise Dynamics



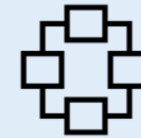
Virtual Optimization

Virtually test and improve any scenario throughout the entire system lifecycle without disrupting the actual system and prepare yourself for the future



Return on Investment

Simulation Software enables you to evaluate your potential and/or future resource investments



System integration

Integrate the Simulation Software within your IT-environment (e.g. ERP Data)



2D & 3D visualization

State-of-the-art 2D and 3D visualization enables you to communicate effectively and supports you in convincing stakeholders



Planning & Preparation

With simulation you can answer all your 'what-if' questions and optimize your resource planning



Deal with uncertainties

Deal with uncertainties and variations of the environment e.g. customer demands or lead times.

Pedestrian Dynamics



Realize Safe & Secure Crowd Management

Simulate unlimited functional scenarios, such as; ingress, egress, crowd flow, queuing, evacuation, sheltering, active shooter, and other terrorist attacks to realize a safe and secure environment



Decrease costs

By optimizing the infrastructure during the design phase, high additional costs can be avoided during operations. Our software offers a rapid model building environment which saves time and costs



Multiple-source data input

Transform CAD drawings and any supported 3D model such as BIM, and CityGML input data into 2D, 3D and VR virtual environments.



Increase customer satisfaction

Increase customer satisfaction by improving pedestrian flows, experiences and comfort and identify the commercial attractiveness of locations by flow measurements.



Intelligent pedestrians

Model intelligent pedestrians with unique properties that route with activity-based routing. The pedestrians can react on triggers and a dynamically changing environment.



Proven Track Record

Pedestrian Dynamics® has been used in many large-scale projects including stadiums, airports, public transport terminals, mega events and urban planning.

Applications of In Controls simulation software



Crowded places

- Leisure and entertainment
- Public spaces in crowded cities
- Commercial venues like theatres, museums, congress halls
- Open air festivals, pop concerts
- Sport arenas and stadiums
- Airports, train stations, (cruise) ship terminals
- ...

Supply Chain

- Discrete manufacturing
- Warehousing and Logistics

Customers and Partners



Workshop participants EMAAR

1. Mark Haak Wegmann
CEO EMAAR EEG Entertainment
2. Bency Kuruthukulam
PA
3. Paul Fox
Director Reel Cinemas – Dubai Mall
4. Mouhamad Hoteit
Director Burj Khalifa: At The Top & Sky Views EEG
5. Mokhtar Musleh Mousa
Director Dubai Aquarium & Underwater Zoo &
6. Maria Magana
Director Kidzania – EEG
7. Havinder Pal
Finance Lead at Emaar Entertainment
8. Rana Fares A. Hmoud
Head of Marketing

Overall observations

- EMAAR has a tremendous position due to its location, architecture, visitor experiences and WW branding. Financial one of most profitable WW organizations due to real estate, tourists revisiting the Dubai EMAAR area
- Tourist peak: October – April with top during Christmas season
- Overall: shift from nett rev driven towards an organization focused on UX
- Customer Intimacy will be distinctive, Product Leadership and Operational Excellence have to be on par (see next page)
- Integrated external from multiple agents/tour operators and internal visitor data required.

Overall observations

- Reflection of the MT-members: *innovative technologies e.g., simulation and wayfinding can steer our meaning of our location to the next level.*
- Combined approach: strategy, road maps and quick wins.
- Integral approach needed: from a CX/experience, investment/profit, staffing point of view.
- As part of continuously development/improvement: relevant investments are needed.
- Innovative introduction: robots, QR-codes, camera and sensors, etc. first ideas more thorough to be analysed as being part of the customer journey.
- Staffing quantitative and qualitative issues at Reel and Kidzania, not at the Aquarium and Burj Khalifa and Sky views

Overall: create an improvement system/cycle, to stay on Top of the World!

Shift in EMAARs organization focus

From Nett REV driven towards Customer intimacy



- Life time experiences: wow + learnings!
- Tailored per visitor group and hot spot
- Service offerings and customer interaction
- Information and 'menu'
- Package and Returning

Source: Treacy and Wiersema

First overview of Points of Improvement

Te be validated

Nr.#	asset	focus area/aspect	concept(s)	orientation	navigation	integrated online ticketing	innovative technology *)	simulation flows/scenarios/ visualization**)	education/ information	redesigning experiences ***)
1	Reel	entrée/visitor segments/floors	Y	Y	Y	Y	Y	Y	N	Y
2	Burj Khalifa	entrée/way to elevators	partly	N	Y	Y	Y	Y	Y	route to elevators
3	Sky Views	location/transfer	partly	N	Y	Y	Y	N	N	N
4	Karting	Azeel location and staires	Y	Y	Y	Y	Y	N	Y	partly
4	Mall of Dubai	overall, scope for now limited	n.a.	Y	Y	n.a.	n.a.	n.a.	n.a.	n.a.
5	Aquarium	ecosystems	Y	Y	Y	Y	Y	Y	Y	Y
6	Kidzania	litterly journey	Y	Y	Y	Y	Y	Y	Y	Y

Legenda

- improvement needed
- improvements partly needed
- improvements for this moment not needed or n.a.

- *) New technology can be adding value e.g., QR-codes, robots, interaction by smart phones and touch screens
- ***) 2D-, 3D-visualization and VR: Oculus
- ***) Physical space has to be made in line with strategy, specific visitor profiles, offered experiences, look & feel, etc.
- ? Overall: testing evac plans

1. Reel Cinema Dubai Mall, Paul / Frank



Challenge

- Reel Cinema Dubai Mall is the busiest cinema in the Middle East.
- As it is one of the busiest cinemas in the region, we encounter also waiting time issues.
- Furthermore, we have some tension as well in our visitor journey:
- A cinema with 4 levels
- Counters at 3 of the 4 levels (having to manage queuing in relation to how busy it is at the various counters and visitors going to theatres at different levels)
- Relatively long handling/processing time at the counter
- Different processing methods at the different counters
- To review (digital) customer journey regarding food sales (online/ticket kiosk/pick up/in seat delivery)

Visit

- visit complete customer journey for Reel Cinema Dubai Mall / focus on arrival area / counters, etc.
- focus on pre-arrival booking process of all type of customers and their subsequent arrival process
- focus on wayfinding within Reel Cinemas

1. Reel Cinema Dubai Mall, observations



- 8 different visitor segments served
 - has to brought back to 3 in line with the number of floors: kids, premium and premium+
 - Not yet a clear vision on segmentation, journey and space
 - New investments needed; wayfinding is insufficient
- Pyramid: top or bottom, mid segment will fail
- Working towards a 3-year plan with quick wins to be defined
- Online ticketing: 60-70%
- Staffing: own: 30%, hired at peak moments 70%
 - not trained/low service awareness and often leaving within 6-8 weeks
- On time arrival: delay caused by car traffic jams and parking issues
 - possibility deck on 1st floor
 - hard to find your way in the Mall of Dubai
 - Impact: pre-ordered meals processed are cold or not picked-up
- Wayfinding/routing: spread visitors to other POS on 2nd floor
- Large number of changes listed, have to be planned/budgeted
- Plan to reallocate ticket kiosks

2. ATT Burj Khalifa, Hoteit / Frank 1-2



Challenge

- At the Top/Burj Khalifa is one of our icon attractions and probably the most iconic attraction of Dubai.
- Everyone wants to see the Burj Khalifa and a lot of (especially) tourists want to go to the top of the highest building in the world.
- Currently we are hosting some 3 million visitors a year, whereas the building was not designed to process such volumes.
- Furthermore, we have several bottlenecks during our customer journey as we have not only the ticket counter, elevators to go up and down, but also a security check and photo opportunity.
- We have also different type of customers (groups, individuals, booked online, walk ins, etc.).
- As a result, our guests are experiencing long waiting times (both at the counter and at our elevators) and confusing queuing system where guests complain that they still need to queue despite buying their tickets online.

2. ATT Burj Khalifa, Hoteit / Frank 2-2



Key question

- How to have less waiting times and improve the overall Customer Experience?
- Issue: visitors complaining that they cannot find our assets easily or we need to drive more traffic to certain assets to increase footfall
- At The Top (Burj Khalifa)
- guests complain that they cannot easily find the attraction

Visit

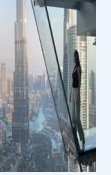
- visit complete customer journey for ATT / Sky Views
- focus on all bottlenecks in ATT customer journey that create waiting times
- focus on pre-arrival booking process of all type of customers and their subsequent arrival process
- visit/review wayfinding for ATT from all directions
- visit/review wayfinding from Dubai Mall to Sky Views

2. ATT Burj Khalifa, observations



- Success from the start: 2010: expected 600K → 900K/Y, today 17M/Y
- Potential growth: international tour operators and deal with short staying airport transfer PAX
- Site not planned, build to host huge number of visitors:
 - 2013 and 2014: 2 decks build on Floors 224 and 225 for view, not planned from the start
 - 2021: Floor 480 (585M, formal property of the royal family), 2 floors premium services
 - Plan: Lamborghini branding
- Bottle necks: 2 elevators
- Plan B: service elevator without experiences of 360' projected images/videos
- Plan C: residential elevator used to go too/from Floor 480
- Issues during windy days: capacity drop by slow down elevators with (normally approx. 400KM/H) 50%
- Maintenance of elevators every night, during day operations: suddenly slowing down
- Suggestion: external open/glass elevator with a lower speed as additional capacity and new(!) premium experience

2. Sky Views, observations



- Recently opened for public: now for 2 years
- Looking out on Burj Khalifa, possible even a more attractive view and exiting activities e.g., the Edge Walkglass and Walkglass Slide. The adjacent space of SKY52 restaurant can be made available as restaurant extension
- Issues are:
 - Relatively new hot spot, not yet discovered by many but growing number of visitors
 - The location: transfer is needed as located outside the Mall of Dubai
- Goal is to attract more visitors from Dubai Mall by offering this hot spot as part of a package offering or including transfer by minivan (?)
- Scale-up of visitor capacity is possible: form 1.5K-2K/D → 3K/D

3. Dubai Aquarium, Mokhtar / Frank



Challenge

- The Dubai Aquarium & Underwater Zoo is another icon attraction in Dubai Mall.
- We process high volumes of guests through this attraction at peak times resulting in queuing/waiting lines in the middle of Dubai Mall.
- Similar to At the Top, we are also having to manage visitors that have either booked online or not and are individual or part of a group.

Visit

- visit complete customer journey for Dubai Aquarium / focus on arrival area
- focus on pre-arrival booking process of all type of customers and their subsequent arrival process
- review wayfinding from Dubai Mall to Zabeel Sports District/Ekart Zabeel and from within Zabeel District

4. Dubai Aquarium, observations



1. Navigation and routing

1.1 Make the customer journey from one ecological zone to another: from the Dubai Aquarium to the mall and continuing in the Aquarium more logic and clear. First steps are made by the for the Mall of Dubai exceptional coverage of the escalators, but additional routing is needed for a more natural navigation and therefore flow.

1.2 Routes in the ecological zones:

- Rainforest, Rocky Shore, and Desert are not clear from a visitors' navigation point of view.
- The current ideas and first plans for re-routing and an additional route on the other side of the basin have to be planned, simulated and re-designed/resigned
- After exploring the aquarium tunnel continue to the Underwater Zoo, which provides an interactive approach to

2. Entertainment and/or education

The strategy is to emphasize the educational function of the Dubai aquarium: the ecology and sustainability of nature and animal (marine) life. The entertainment aspects will still be important and underpinned by the extraordinary number of species and activities offered.

3. Overall customer expectations

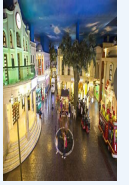
- Expectation outside the Dubai Aquarium are not in sync with the inside experience.
- A re-design and upgrade is relevant as the impressive aquarium wall indicated the same magnitude of impressions.
- Accent on Education can offer visitors commentary values.

5. Dubai Mall Zabeel Sports Districts, observations



- As Zabeel district is linked to the mall, but clearly not (yet) integrated or aligned within the mall:
- signage is needed as well at the entrance and at the staircases entrance of the karting centre
- The entrée less spectacular than expected, part of parking garage.
- No or less linkages to the experiences outside e.g. :
 - Crafting memories by making photo in the back the tremendous view on Burj Khalifa
 - The thrill of racing experiences: 'being Max Verstappen' for the coming moments
 - The competition element: competing and opting for 'gold'
 - The fun factor: being and enjoying with Friends or Family and having fun
- Commercial suggestion: analyse sponsoring of large race, petrol or sponsor labels - as we see in Kidzania

6. Dubai Kidzania and Ice Rink Dubai Mall, Maria / Frank



Challenge

- long waiting time to go into the attraction followed by waiting times at the various establishments to do the various activities

Visit

- visit complete customer journey for Kidzania / focus on arrival area / how can we make check in less complex?
- focus on pre-arrival booking process of all type of customers and their subsequent arrival process

6. Dubai Kidzania and Ice Rink Dubai Mall, observations



- Inside and outside Kidzania the Look & Feel are outdated
- Advises:
 - redefining the target audiences, also in comparison with Kidzania Abu Dhabi
 - Stronger linkage to the journey, entering a new exciting world (Emirates) is possible.
 - Educational part is besides the 'shops' and workshop due to the learning by doing limited. Other learning styles are not/limited addressed
 - Develop more clear routing and navigation
 - More exposure of professions, cooperation with educational institutes possible?
 - Create 'events' in during the visitors journey as today it is a steady flow from one to another 'shop'. By this you can attract and interact with the children (and their parents)
 - No clear signage outside and inside Kidzania.

Remark: no observations on the Ice Rink, except on one hand the impressive dimensions of the rink and video wall the Look & Feel of the functional parts seems to need an upgrade. The (franchised) restaurant was not in operations, seems to be a not integrated part of the customer journey/experiences.

Example Ski Dubai: Results: exceeding quality



Shift from a 'No-Zone' towards a 'Place to Be'

- Optimize the Ski Dubai experience
- Optimize the guest process: 'journey'
- Improve communication packages
- Sales growth
- UX and NPS WW high
- Staff capacity optimization
- Space optimization
- Employee satisfaction increased

Meeting goals/results (KPI's) of the overall Strategy, Operations, HR and Finance
by
Data driven and Connecting, People with Spaces and Places

Applications simulation software



Crowded places

- Leisure and entertainment
- Public spaces in crowded cities
- Commercial venues like theatres, museums, congress halls
- Open air festivals, pop concerts
- Sport arenas and stadiums
- Airports, train stations, (cruise) ship terminals
- ...

Supply Chain

- Discrete manufacturing
- Warehousing and Logistics

Rules of thumb

Simulation

Crowded

- Transfer locations: Level of Service – Fruin
- Transfer locations

Wait

- Guidance: number of signs/lay-out
- 'Purple guide' Purple guide to health, safety and welfare at music and other events.
- Simulation: *Academic Research*
- IMO: International Maritime Organization
- NIST: National Institute of Standards
- RIMEA: Richtlinie für Mikroskopische Entfluchtungsanalysen
- Evacuation and safety and security: emergency ruling form US incorporated (e.g., shelter and place, bombing and active shooter scenarios).

Wayfinding

- Legibility, Reading distance Distance to read information, made specific for the context
- Contrast Contrast of colours to ensure visibility within environment
- Spatial guidance Light, doors, walk troughs...
- Advice on branding, purpose with navigation by understanding of the context

To wrap up ...



Improve
decision-making



Optimize Business
Processes



Support
design - operations



Improve
Safety & Security

THANK YOU

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