Structural drivers support Kalmar’s long term profitable growth

Site visit 21.11.2016

Dr. Antti Kaunonen
Structural drivers support Kalmar’s long term profitable growth focusing on automated container ports

- Introduction
- Kalmar in brief
- Market drivers
- Kalmar strategy with the focus on automated container ports
- Summary

15 Sep 2015
Great long-term possibilities in automation and in software solutions, only a question of timing

Kalmar has established PMO to support services growth

Profitability to improve also by growth in services

Our industry is over ten years behind other industries using automation (and IT) as a competitive advantage
Structural drivers support Kalmar’s long term profitable growth focusing on automated container ports

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<table>
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<td>Introduction</td>
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<td>Kalmar in brief</td>
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<td>Kalmar strategy with the focus on automated container ports</td>
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<td>Summary</td>
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15 Sep 2015
Kalmar in brief

- Kalmar is the market leader in container handling equipment, port automation and services.
- Our customers include port and terminal operators, distribution centres and industry.
- Kalmar is part of Cargotec Oyj
One in four container movements around the globe is handled by a Kalmar solution.
TOS coordinates and optimises the planning and management of container and equipment moves in complex business environments.

Navis provides also maritime shipping solutions:
- Stowage planning
- Vessel monitoring
- Loading computer
- Route planning
  
  Stowman
  MACS3
  Blue Tracker

The collaboration platform serving the needs of ocean carriers, terminals and their shipping partners.

Industry leading spreader manufacturer

Our operating environment
Kalmar business area solutions

Automation and Projects (APD)
- STS cranes
- ASCs
- RTGs
- Straddle carriers
- Shuttle carriers
- AGVs
- Automation (TLS)
- Process automation
- OneTerminal

Mobile Equipment
- Reachstackers
- Empty container handlers
- Forklift trucks
- Terminal tractors

Services
- Crane upgrades
- Maintenance
- Spare parts
- Used equipment
Kalmar business area solutions

- Terminal Operating Systems
- Collaboration Cloud
- Vessel Optimisation

- Spreader
- Automatic Twistlock Handling
Example of an automated terminal project

**Horizontal transport**
- AutoShuttles

**Quay**
- Automated Lashing Platform (ALP)

**Container yard**
- Automated Stacking Cranes (ASCs)

**Operations**
- TOS
- TLS
- M&S

**Services**
- Spare parts, maintenance contracts
- 24/7 on-call and remote diagnostics

**Process automation**
- SmartFleet, SmartTrucks, SmartLanes
Kalmar has a true one-stop shop capability
Konecranes-Terex merger slightly to change the picture

<table>
<thead>
<tr>
<th>Suppliers Solutions</th>
<th>Kalmar</th>
<th>ZPMC</th>
<th>Konecranes</th>
<th>Terex</th>
<th>Liebherr</th>
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Competitors with automation background
Kalmar Q3 – satisfactory development

- Order intake declined 16% y-o-y to EUR 389 (463) million as customers postponed their bigger investment decisions
- Order book strengthened 5% from 2015 year-end level to EUR 922 million
- Sales grew 6% y-o-y to EUR 436 (409) million
- Profitability excluding restructuring costs was 8.3% (8.8%)
- Increased investments in automation and software development decreased profitability
- Sales mix had a negative impact on profitability

![Graph showing orders, sales, and operating profit% for Q3/15 to Q3/16]

Large orders during Q3/15

*excluding restructuring costs
## Kalmar’s profit improvement potential 2016-2018

<table>
<thead>
<tr>
<th>Year</th>
<th>Automation</th>
<th>Software</th>
<th>Mobile equipment</th>
<th>Services</th>
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<tbody>
<tr>
<td>2015</td>
<td>Project delivery capability development</td>
<td>Expand software business</td>
<td>Continuous improvements in design-to-cost and sourcing</td>
<td>Excel in spare parts</td>
</tr>
<tr>
<td>2016</td>
<td>Expand Rainbow Cargotec Industries (China) joint venture offering</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2017</td>
<td>Further development of integrated port automation solutions</td>
<td></td>
<td></td>
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<tr>
<td>2018</td>
<td></td>
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</tbody>
</table>

**Total improvement potential**

- **60-100 EUR million**
- **+20-30 EUR million**
- **+10-20 EUR million**
- **+20-30 EUR million**
- **+10-20 EUR million**

Colour on the bubbles indicates the progress.
Kalmar has strong position in attractive segments

<table>
<thead>
<tr>
<th>Segment</th>
<th>Market position</th>
<th>Market size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automation &amp; Projects</td>
<td>#1-2</td>
<td>EUR 7.5 billion</td>
</tr>
<tr>
<td>Mobile equipment</td>
<td>#1</td>
<td>EUR 7.6 billion</td>
</tr>
<tr>
<td>Bromma</td>
<td>#1</td>
<td></td>
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<tr>
<td>Navis</td>
<td>#1</td>
<td></td>
</tr>
<tr>
<td>Services</td>
<td>#1</td>
<td></td>
</tr>
<tr>
<td>Product Line</td>
<td>Net Sales, EUR million</td>
<td>Trend in Orders, last 12 months</td>
</tr>
<tr>
<td>-------------------------------------------------</td>
<td>------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Kalmar software (Navis) and Automation and Projects division</td>
<td>~500</td>
<td>Low due to long term investments</td>
</tr>
<tr>
<td>MacGregor</td>
<td>~800</td>
<td>-34%</td>
</tr>
<tr>
<td>Hiab</td>
<td>~1,000</td>
<td>+4%</td>
</tr>
<tr>
<td>Kalmar equipment and service (excluding Automation and Projects Division &amp; Navis)</td>
<td>~1,200</td>
<td>Low double digit</td>
</tr>
</tbody>
</table>

* Figures rounded to closes 100 million
Perception of our current situation

**Strengths**
- Our strategy is good
- The market is there for long term
- Asset-light
- Kalmar brand
- Dedicated employees

**Improvement opportunities**
- Service growth
- Seamless integration of automation and IT offering
- Safety consciousness
- Profitability improvements
Structural drivers support Kalmar’s long term profitable growth focusing on automated container ports
Major trends affecting Container Shipping

**Capacity**
- Continued demand growth
  - Container shipping expected to grow more slowly at 2% per year until 2020 compared with historical growth of 6%

- Increasingly larger vessels
  - Increasing operational complexity in stowage, berth and yard capacity management

- Capacity oversupply
  - Increase in short term spot market buying and last minute booking (14-21 days vs. approx. 5 days) leads to poor capacity management

**Shipping**
- Shipping line consolidation
  - Creates opportunities for IT investment through the review of existing processes and consolidation of operational IT systems

- Broadening of alliances
  - Increases operational complexity at network, vessel and terminal level

**Terminals**
- Terminal consolidation
  - Top-10 terminal operators seeking to simplify and standardize their IT landscape

- Increasing hub-and-spoke networks
  - Increases the number of container moves in the supply chain and the complexity of planning

**Automation**
- Terminal automation
  - Terminal operators look for automation opportunities to improve efficiency and throughput, while reducing labor costs

**Other**
- Bunker prices
  - Fuel costs represent significant percentage of operating costs. This requires efficiency improvements by optimizing trim, ballast, speed and route

- Shift to forwarders
  - Information flow is increasingly important for shipping partners to manage their supply chain
Container throughput still forecasted to grow year on year

Source: Drewry: Container forecaster Q3 2016

November 2016
Global container throughput development
Growth stabilising in the short-mid term

Global container throughput and GDP, change % y/y

Source: IMF July 2016, Drewry August 2016
Global Container terminal volume and Capacity Development

Source: Drewry Container terminal operator annual review, 2002-2016
Macro indicators and industry trends support growth in automation

- Ships are becoming bigger and the time in port needs to be shorter.
- Optimum efficiency, space utilization and reduction of costs are increasingly important.
- Safety in the terminal yard has become even more of a focus for operators.
- Importance of sustainable operations is growing.
- Shortage and cost of trained and skilled labor pushes terminals to automation.
Ship sizes increasing dramatically

- The largest containership in the fleet has nearly tripled since 2000.
- The average size of new builds doubles between 2009 and 2014

Source: Drewry November 2015
Ships are becoming bigger…

- Larger container ships have generated cost savings for carriers, decreased maritime transport costs and as such facilitated global trade in the past.

- Larger ships require adaptations of infrastructure, equipment and cause larger peaks in container traffic in ports, with wide-ranging impacts.

<table>
<thead>
<tr>
<th>Shipping line</th>
<th>Name</th>
<th>TEU capacity</th>
<th>Since</th>
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<tbody>
<tr>
<td>Maersk</td>
<td>Triple E series</td>
<td>18,100</td>
<td>2013</td>
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<tr>
<td>China Shipping</td>
<td>CSCL Globe series</td>
<td>19,100</td>
<td>2014</td>
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<tr>
<td>MSC</td>
<td>Oscar, Oliver</td>
<td>19,200</td>
<td>2015</td>
</tr>
<tr>
<td>MOL</td>
<td>n.a</td>
<td>20,000</td>
<td>2017 (expected)</td>
</tr>
<tr>
<td>CMA*CGM</td>
<td>n.a</td>
<td>20,600</td>
<td>2017 (expected)</td>
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<td>n.a</td>
<td>21,100</td>
<td>2017 (expected)</td>
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Maersk Triple E series ship  
MSC Oscar
Main barriers in ports for Mega Ships

Need for longer and stronger quays

- Mega-carriers are putting increasing pressures on existing terminals, which, in most cases, have not been built with the assumption that ship size would grow so fast so quickly. In many ports quay walls need to be heightened, strengthened and lengthened.

Cranes

- Larger ships pose challenges to cranes in terms of outreach and height. The newest mega-ships require a crane width that allows for handling 23 container rows. One of the increases in TEU capacity in comparison with the first Triple E-ships is stacking one row higher (11 high instead of 10), which means that various container terminals would need to be higher as well.

Insufficient landside connections

- Landside connections in existing terminals may become bottlenecks during greater cargo peaks caused by mega-carriers.
Consolidation leading to five dominant container terminal operators in 2020

- 24 Global Terminal Operators’ total forecasted capacity increase 2015-2020 is 125 Mteu, increasing 3.1% p.a to 892 Mteu by 2020

- Terminal operators consolidating, recent M&A activity:
  - COSCO and China Shipping merged
  - APMT bought Group TCB
  - CMA CGM bought APL
  - Yildrim bought Portugese Tertir group and the company is also eyeing Ports America

Source: Drewry
Three Alliances represent about 80% of global container fleet capacity

21 November 2016

*HMM’s membership in 2M alliance isn’t yet confirmed

The arrows indicate changes through M&A over the last 12 months

China Shipping and Cosco=Cosco container lines

Total: 16

2017

Ocean Alliance

Grand Alliance

New World Alliance

Ocean Three

P3 (denied)

2M

G6 Alliance

CKYH Alliance

The Alliance (in preparation)

Independent

6

4

3
DS Research: 298 Mteu new capacity to be added 2016-2021 which could trigger US$bn 37 investments for container handling equipment

- According to DS Research, the project pipeline of all upcoming container terminal projects consists of 405 TEUm additional capacity scheduled for completion until 2021. 298 TEUm new capacity is expected to be finally executed until 2021, assuming that further project postponements are required to adjust to the weakening demand. This would trigger roughly US$bn 146 investment.

- Depending on the type of project, different costs have been assumed for quay construction, container handling equipment, yard construction, dredging & land reclamation and other costs. Overall, DS Research has estimated that investments for container terminal projects 2016-’21 include about US$bn 37 for container handling equipment.
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Kalmar strategy: Focusing on profitable growth

Increasing the speed of execution of our strategy gives us a competitive advantage.

To become number 1 automation and container handling solution provider in our industry.

- Win in automation
- Grow in software
- Sustain global leadership in mobile equipment
- Excel in spare parts

Digitalisation
Operational excellence
People

Strategic target
Must-win battles
Key enablers
Strategy update – focus still on speed and execution

- Kalmar’s strategy still valid
- The execution has not progressed fast enough in all areas
- Measures taken to speed up the development
- Main focus areas for improvement: Services related actions in all divisions and regions and cost control

<table>
<thead>
<tr>
<th>Must-win battle</th>
<th>Status</th>
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<tbody>
<tr>
<td><strong>Win in automation</strong>: No new automation or mega project orders received</td>
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<tr>
<td><strong>Grow in software</strong>: Roadmap proceeding according to plan</td>
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<tr>
<td><strong>Sustain leadership in Mobile Equipment</strong>: Global market share of reachstackers</td>
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<tr>
<td><strong>Excel in spare parts</strong>: Global monthly parts sales</td>
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</table>
Win in automation
Automating terminals

Technology development has made it possible

Safer working environment

Industry trends support growth in automation

Improved operations
Massive Robots Keep Docks Shipshape
Wall Street Journal March 2016

http://on.wsj.com/1XX0TFy

YouTube videos
Kalmar ASC system in operation at Trapac
https://www.youtube.com/watch?v=0CdkS9rq5ik
Trapac Los Angeles 2015
https://www.youtube.com/watch?v=ICtpvdzt134
Kalmar automated horizontal transport system at Trapac
https://www.youtube.com/watch?v=cVw5TIq6GDo
Kalmar automated straddle carries at Trapac (no audio)
https://www.youtube.com/watch?v=lpmqllKyBSQ
What is the Kalmar state of the art?
Sydney Morning Herald June 2015

Our Vision:
Future container terminal with high automation level

The container terminal of the future will have two employees: a man and a dog.

The man will be there to feed the dog, and the dog will be there to keep the man from touching anything!
We are not so far away from the vision...
Automating terminals

Technology development has made it possible

Safer working environment

Industry trends support growth in automation

Improved operations
The main reason for the improved safety is the fence!!!
“In the first year of automation at our Brisbane AutoStrad™ Terminal, we achieved a 75% reduction in safety incidents, increasing to a reduction of 90% in following years. It is only logical that we look to replicate this success at our biggest container terminal at Port Botany.” (John Mullen, MD & CEO Asciano Ltd, 22/8/2012)
Automating terminals

Technology development has made it possible

Safer working environment

Industry trends support growth in automation

Reduce operational costs
Macro indicators and industry trends support growth in automation

- Ships are becoming bigger and the time in port needs to be shorter
- Optimum efficiency, space utilization and reduction of costs are increasingly important
- Safety in the terminal yard has become even more of a focus for operators
- Importance of sustainable operations is growing
- Shortage and cost of trained and skilled labor pushes terminals to automation
The number of highly automated terminal will increase fast.

Industry is still in wait and see mode.
Current operational and ordered terminals

Three main types of automated terminals exist in the market.

- Semi-automated, typically container stack is automated but horizontal transport is done manually
- Fully automated, both stack and horizontal transport are automated
- Remote controlled desk is used to operate the cranes, typically in used in RMG terminals

Source: Kalmar internal
Estimated number of automated terminal orders by 2020

- We estimate ASC / ARMG solutions to be more than 70% of the growth and rest would be Auto RTG conversions and AutoStrads terminals.
- Most of these are brownfield projects

Source: Kalmar SalesForce 11/2016
Automating terminals

- Technology development has made it possible
- Safer working environment
- Industry trends support growth in automation
- Improved operations
Great business case for port automation
Cost saving example in a typical automated terminal

Indexed P&L manual terminal*

<table>
<thead>
<tr>
<th>Cost Category</th>
<th>Value</th>
<th>When converted into an automated operation:</th>
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<tbody>
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<td>Revenue</td>
<td>100</td>
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<tr>
<td>Labour Cost</td>
<td>40</td>
<td>60% less Labour Costs 16</td>
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<tr>
<td>Maintenance</td>
<td>8</td>
<td>20% less Maintenance 6.5</td>
</tr>
<tr>
<td>Power &amp; Fuel</td>
<td>4</td>
<td>25% less Power &amp; Fuel 3</td>
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<td>IT</td>
<td>2</td>
<td>50% higher IT 3</td>
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<tr>
<td>Depreciation</td>
<td>10</td>
<td>30% higher Depreciation 13</td>
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<tr>
<td>Other Costs (land, overhead)</td>
<td>18</td>
<td>Assuming same overheads 18</td>
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<tr>
<td>Total costs</td>
<td>82</td>
<td>27% less costs 59.5</td>
</tr>
<tr>
<td>Profit</td>
<td>18</td>
<td>125% profit increase 40.5</td>
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Additionally, improved safety reduces number of lost working hours, equipment damage costs and insurance premiums

*) Typical manual operation in Europe
RTG automation levels for different transition strategies

- **Remote control.** Operator controls all of the operational moves of the AutoRTG from a central control centre.
- **Assisted automatic moves.** Operator remote operation with needed automatic gantry, trolley and host moves.
- **Automatic gantry and trolley.** Gantry and trolley moves are automated, and the operator remotely controls all the host and truck tare movements.
- **Automatic pick and place on stock.** Gantry, host and trolley moves are fully automated, as well as pick and place on stack and hose feeding. The operator remotely controls all movements in the truck lanes.
- **Fully Automated.** Fully automated solution with automated truck handling and automatic horizontal transport. An operator is now only needed for the handling of exceptional circumstances.
Kalmar for automated ports

1. Kalmar is 100 % committed to the industry
   - We prosper and suffer together with our customers
   - We know the industry and understand our customer needs

2. Kalmar has it all from the intelligent equipment to the TOS being able to deliver a total turnkey solution without finger pointing
   - We build our knowhow from the Top and from the Bottom
     - Top = TOS
     - Bottom= Intelligent Equipment

3. Kalmar focuses on CO₂ and NOₓ free solutions

4. Kalmar supports the customers through the life cycle services

5. Kalmar can test its solutions in its premises
Grow in software
Grow in software
Software offers significant growth opportunities

- Container value chain is woefully inefficient, with total value at stake estimated at approx. EUR 17 billion
- We believe technology can fix many of these inefficiencies and need for standardization
- The aim is to create a significant software business serving the terminals and shipping lines around the Navis brand
- We are also investing in our software capabilities in Kalmar automation and projects business to secure critical resources
Making global trade smarter, safer and more sustainable for everyone - 2020

**NAVIS**

**OPEN COLLABORATION PLATFORM (XVELA)**

**DATA HUB**

- #1 TOS for Automated Terminals. Support all equipment types and ECS, expand optimization service, better, intuitive user experience
- Expand further into in-house TOS
- Enterprise TOS that supports remote operations, lowers IT and operational costs, and enterprise BI
- Emulation/Simulation

**Value proposition:**
Optimize day to day operations of all types of terminals in portfolio and provide high level visibility and insights across the enterprise

**TOS**

- #1 Automated Stowage Planning solution.
- Expand into vessel capacity management and allocations systems to help improve capacity and vessel utilization
- Berth window availability and management and port to port call visibility
- Vessel performance optimization and monitoring
- Ship’s Schedule Hub

**Value proposition:**
Port to port vessel operation in one integrated centralized platform enabling lean and efficient processes and data driven decision making

**Vessel Capacity**

- Expand into Shipper solutions
- Connect Shippers to other players in the container value chain
- Add Terminal container events critical to shippers planning intermodal container moves

**Value proposition:**
Provide Container flow visibility – Shippers can forecast and track container flow from stuffing to delivery to final destination.

**Shipper Systems**
Sustain global leadership in mobile equipment
Sustain global leadership in Mobile Equipment
Focus turning from internal efficiency to market coverage

Distribution network
- Hybrid model for China
- Strengthen dealers in North America and EMEA

Competitive Offering Based on Customer Value
- Launch of digital products in TOC 2016
- Remotely connected fleet for services
- TT Europe: Penetrate distribution segment

Value Chain Excellence
- Material cost reduction of 3% year over
- Active Sourcing Management including spare parts
- Move forklift assembly to Poland and create new site in Ljungby
Key Kalmar investments into the MAUs

RCI in Taicang, China

Stargard, Poland
Excel in spare parts
Why to set up the Service PMO?

Aim is to speed up our growth in Services business by pushing us towards short-term wins but also adding muscle to longer term development actions

- **To enable faster decision making and escalation of issues**
  - Actions to put focus on service sales growth

- **To secure the needed resources and speed up our current Services initiatives**
  - Implementation of new tools and processes

- **To improve the role of Services within Mobile Equipment and Automation & Project businesses**
  - Improve cooperation between different business units
  - Bring more accountability to the divisions for integrating services better into their offering.
Service sales growth

- Active customer contacting
- Analyse sleeping customers
- Active Fleet Management
- Focus on contract offering
- Dealer cooperation
- New offering

Bi-weekly meetings and mid-month performance reviews
New tools and methods

Parts eCommerce
Telematics
Training
Field service tool
Supporting your efforts to reduce your carbon footprint.
All essential information is available for the driver in manual operation.

**The solution**

- Charging pole
- Contact dome
- WLAN communication between machine and charging station
- Charging power station
- Pantograph
- Automated machine position recognition and charging sequence

**Charging type:** DC fast charging

**Charging power:** 0-600 kW

**Time to full charge:** 5 min @ 600 kW

**Typical charging time in one operation:**
- 30 to 180 sec @ 600 kW

***KALMAR***
Kalmar highlights lately

18 all-electric AGVs to be delivered to PSA Singapore

First Hybrid AutoSC orders by TraPac and VICTL

14 Kalmar T2 terminal tractors to Abu Dhabi Terminals in Dubai

SW strategy implementation
Navis TOS expansions
Xvela
Interschalt acquisition

Kalmar FastCharge™ technology expanded to hybrid straddle and shuttle carriers

New Li-ion battery technology for electric forklift trucks
Structural drivers support Kalmar’s long term profitable growth focusing on automated container ports
Summary

- Great long-term possibilities in automation and in software solutions, only a question of timing
- Kalmar has established PMO to support services growth
- Profitability to improve also by growth in services

Our industry is over ten years behind other industries using automation (and IT) as a competitive advantage
Making your every move count