ARTIFICIAL INTELLIGENCE: CASE STUDIES

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OUR EXPERTISE

Enterprise optimization
- Scheduling, rostering, timetabling, allocation…
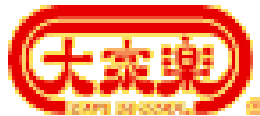
Business intelligence
- business rules, decision support

Knowledge management, data mining, text mining
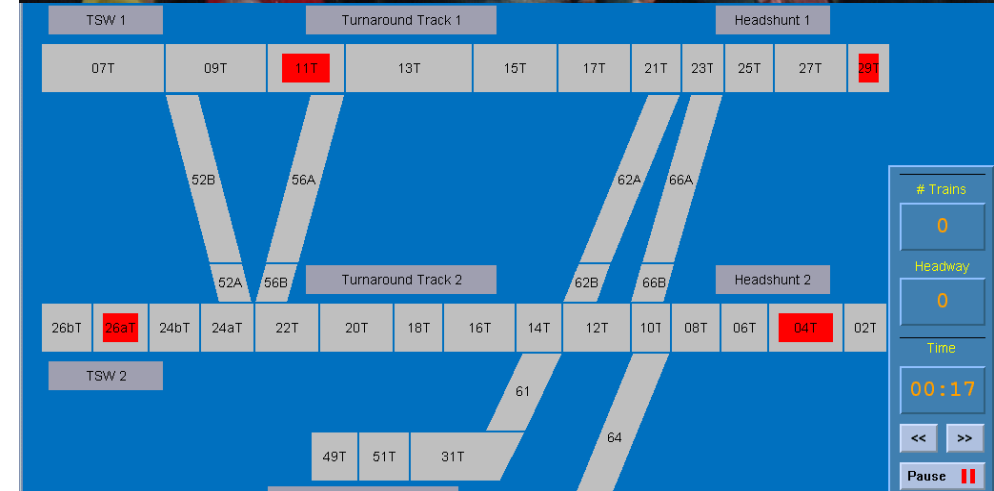
Machine learning

AI CASE STUDIES

MTR: TRAIN DISPATCHING (1995)

Schedule dispatch of trains at TSW line

Complexity too difficult for humans
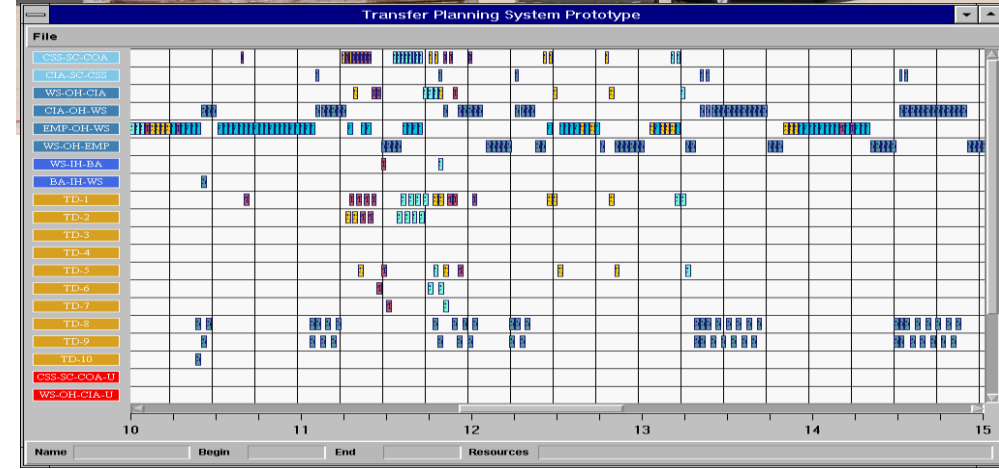
Increased number of trains during rush hours

HACTL: RESOURCE ALLOCATION (1995)

Allocation of equipment, schedule ULD movement, allocation of work space, rostering of workers

Increased efficient and flexibility to cope with dynamic changes

Technology transfer

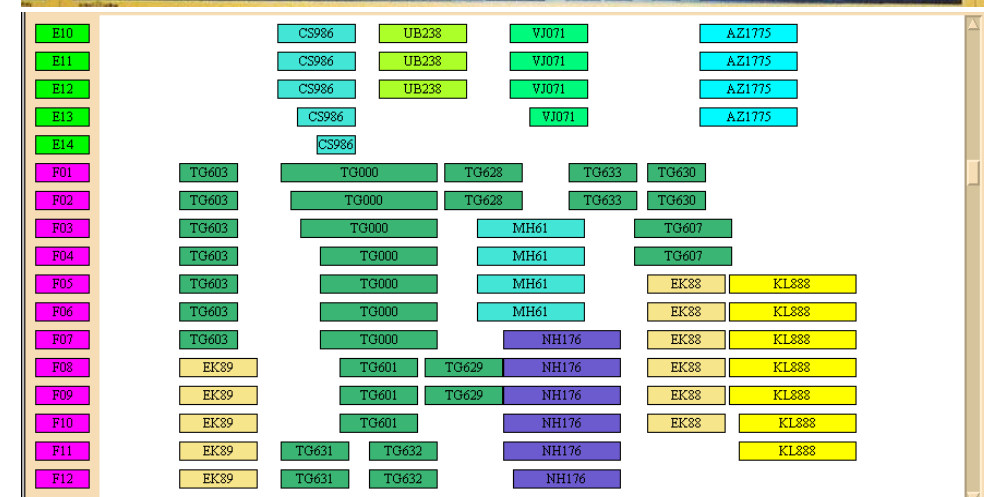# CAD: CHECK-IN COUNTER ALLOCATION (1996)

Combine simulation with constraint-based scheduling

Increase traffic, while maintaining service levels

+8,700 flights in 1996; +6,360 flights in 1997

HIT: STAFF ROSTERING (1996)

Yearly workforce forecasting, monthly roster of equipment operators

Support flexible shifts

Increased overall efficiency

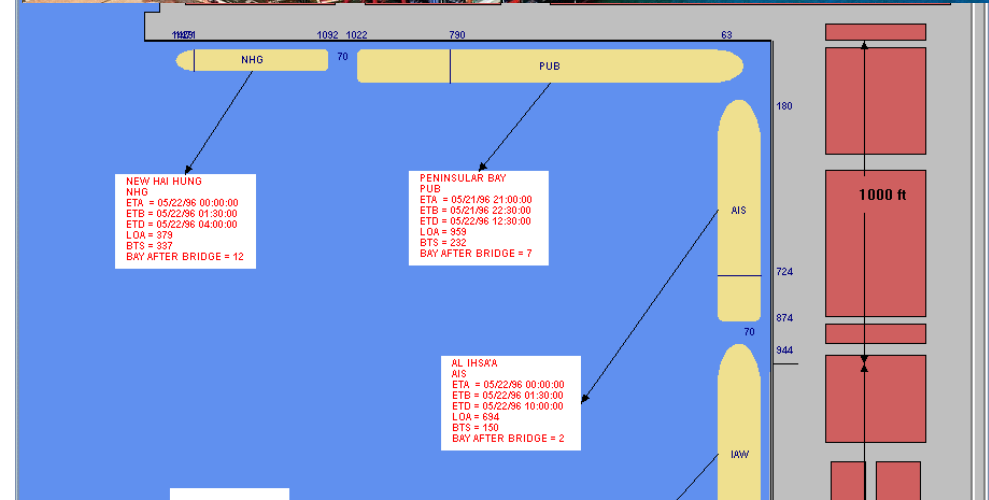# MTL: BERTH ALLOCATION & ROSTERING (1996)

Container vessel berth allocation, rostering for equipment operators

Increase number of vessel berthing, efficiency in manpower usage
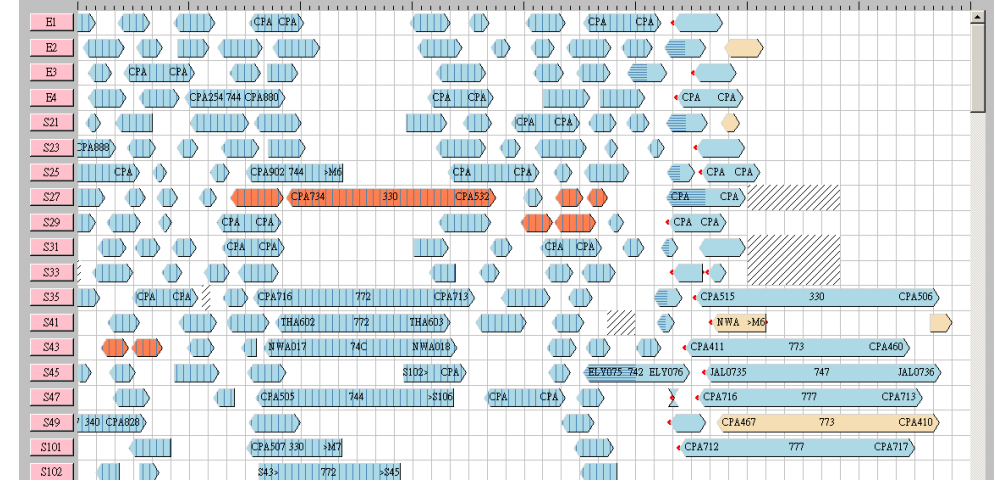
Prototype in 1996

AA: STAND ALLOCATION (1998)

24x7 real-time stand allocation

Multi-user system used in control tower

In use for over a decade

HA: STAFF ROSTERING (1998)

Satisfy all HA and Labor regulations, ensure fairness, cope with changes
in demand and availability

In use for over a decade

KMB: BUS TIMETABLING (1998)

Timetabling requirements - service freq, travel times, operational needs, bus types + driver duty requirements - meal breaks, rest breaks, working hours

Dead runs, interworkings, home depot constraint, supplementary buses,

Prototype in 1998

CAFÉ DE CORAL: LUNCH BOX ORDERING (2000)

School lunch box order processing system; interfaced to optical mark reader

Handle over 10,000 lunch box orders weekly

Produce production orders, delivery schedules, & EIS reports

編號	飯盒編號	飯盒名稱
1	4501011	節瓜枝竹炆排骨
2	4501021	生炒排骨飯
3	4501041	西汁焗排骨飯
4	4501071	豉椒排骨飯
5	4501082	金沙骨意粉

日期 2000年2月29日 (星期二) 關閉

登入

Asia Pacific Catering

飯盒訂單處理系統

使用者名稱(U) user

密碼(P) ****

確定   取消

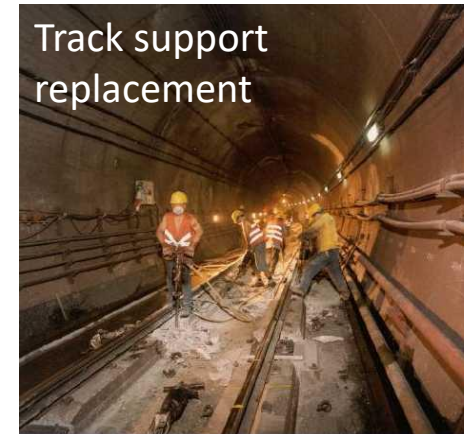# MTR: ENGINEERING WORKS (2004)

Engineering Works and Traffic Management System (ETMS)

Over 1,000 engineering tasks, at over 50 stations

Increased capacity for engineering tasks by 200%

2005 APICT Award - Best Industrial Application – 1st Prize

Tunnel lining strengthening

Railway extension interfacing

Track support replacement

EMU / signalling testing

Rail replacement

Ultrasonic testing

IMMD: APPLIES (2005)

Application and Investigation Easy System (**APPLIES**)

>100 types of application forms, >4 million submissions yearly

Time consuming to process, need thorough knowledge of HK laws and regulations, need experience to make discretionary judgment on "special" cases
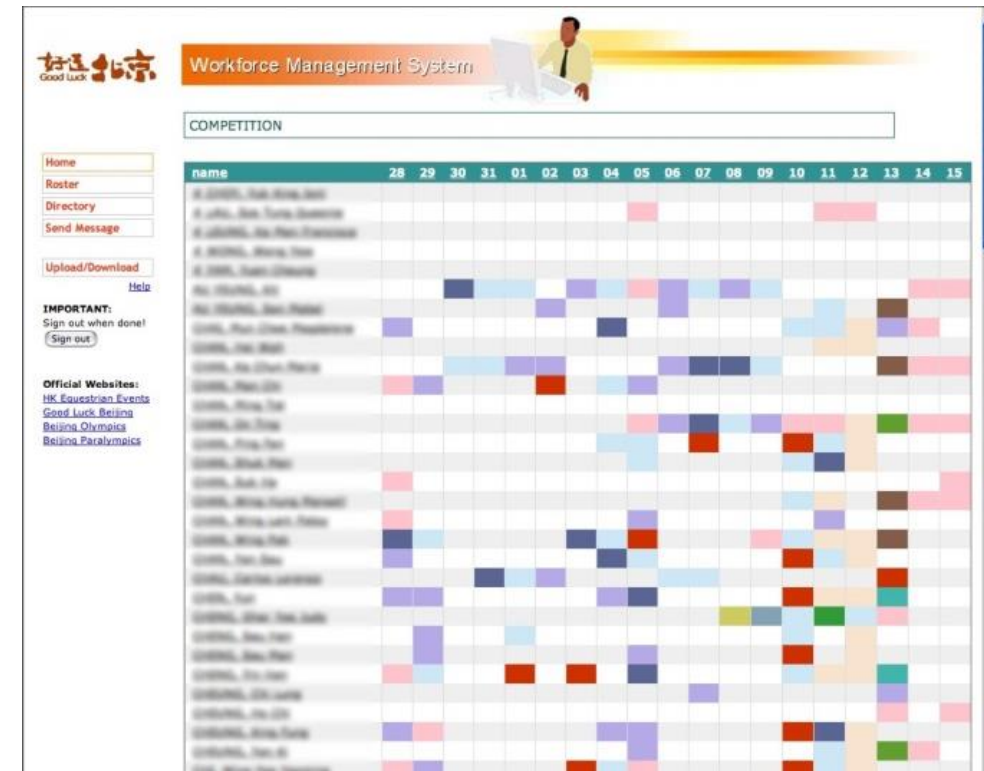
OLYMPICS: VOLUNTEER ROSTERING (2007)

Used in the "Good Luck Beijing" games

Ensure adequate staff level for all functions

Constraints – max hr, skill sets, vicinity, availability, home division

EPD: INFO RETRIEVAL SYSTEM (2010)

Legislative Council's Finance Committee

- Public Works Subcommittee - Information Retrieval System (PWSC-IRS)

Text-mining, environmental-specific search

MTR: ENGINEERING WORKS (2013)

Support all railway lines – 10 heavy rail, and 12 light rail lines

- >2,600 weekly works; >10,000 maintenance personnel
- >3,000 users (MTR staff and contractors)

2014 HKICT Award – Best Business Application (Grand Award)

MTR: FARE CALCULATOR (2017)

Suggest cheapest combination of different fare schemes and discount promotions

Based on customer daily travel patterns and time

MTR has complicated fare scheme structure, such as Octopus, City Saver, Day Pass, Monthly Pass Extra, etc. plus various discount promotions

It is not uncommon for a single trip to have several applicable promotional discounts

Used AI to encode knowledge and constraints for fare schemes and promotions
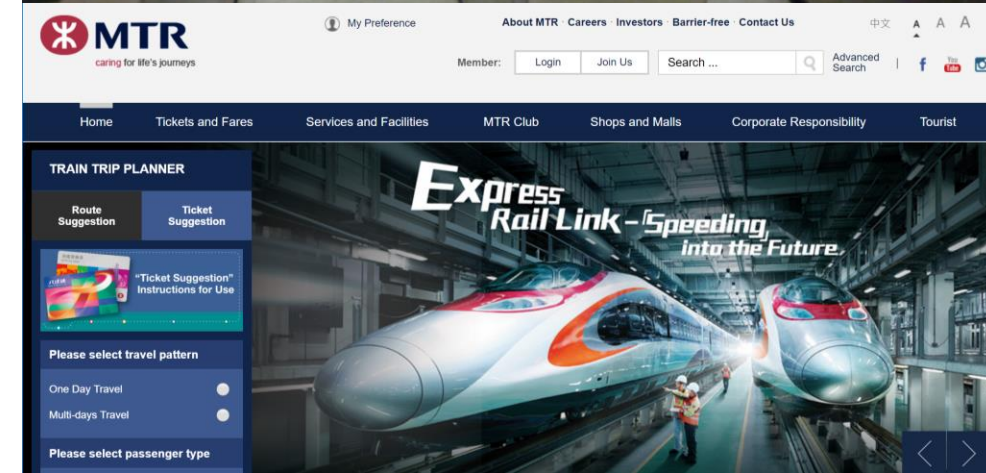
AI has been improving the quality of life for millions of Hong Kong citizens daily!

THANK YOU!