

Putting the “Intelligence” into Intelligent Transportation Systems

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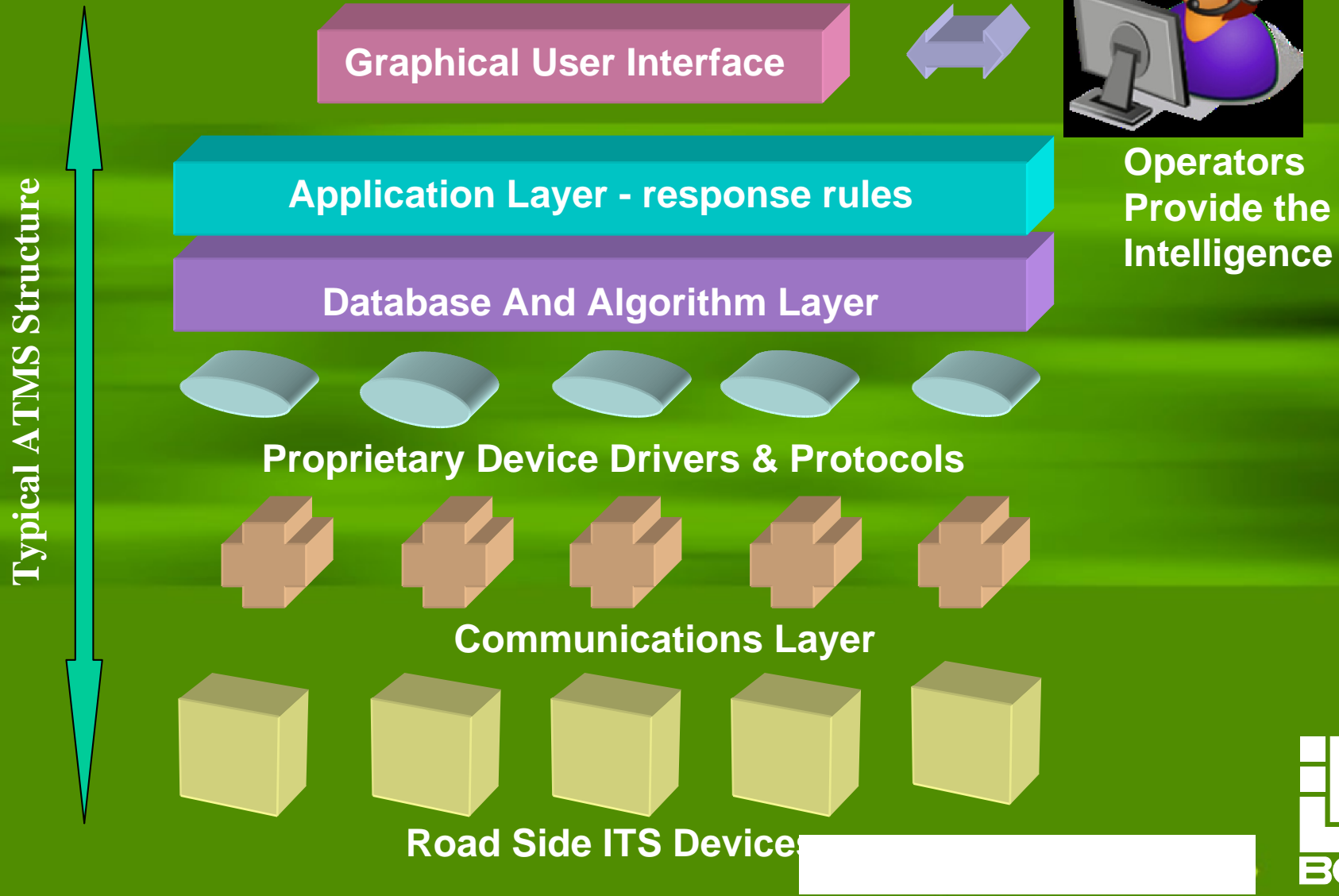


WHERE THE REAL “INTELLIGENCE” RESIDES IN AN INTELLIGENT TRANSPORTATION SYSTEM

- A “system” is a combination of people/process and technology.
- Most “Intelligent Transportation Systems” are components in a wider decision support framework.
- Intelligence is typically vested in Operators who use outputs from ITS based technologies in order to make better decisions.
- Decision Support is therefore the real aim of ATMS systems and therefore the area to invest more “Smarts” in.



WHERE THE REAL "INTELLIGENCE" RESIDES IN AN INTELLIGENT TRANSPORTATION SYSTEM – ATMS View



WHERE THE REAL "INTELLIGENCE" RESIDES IN AN INTELLIGENT TRANSPORTATION SYSTEM – Decision Support View



Operators Act on Intelligence

Graphical User Interface

Business Logic

Predictive Situation Manager

Reactive Situation Manager

Device Control

Common Communications Layer + Protocols

SNMP Open MIBS

Physical Communications Layer

Road Side ITS Devices

Incident Processing Logic

Fault Management Logic

Motorway Management

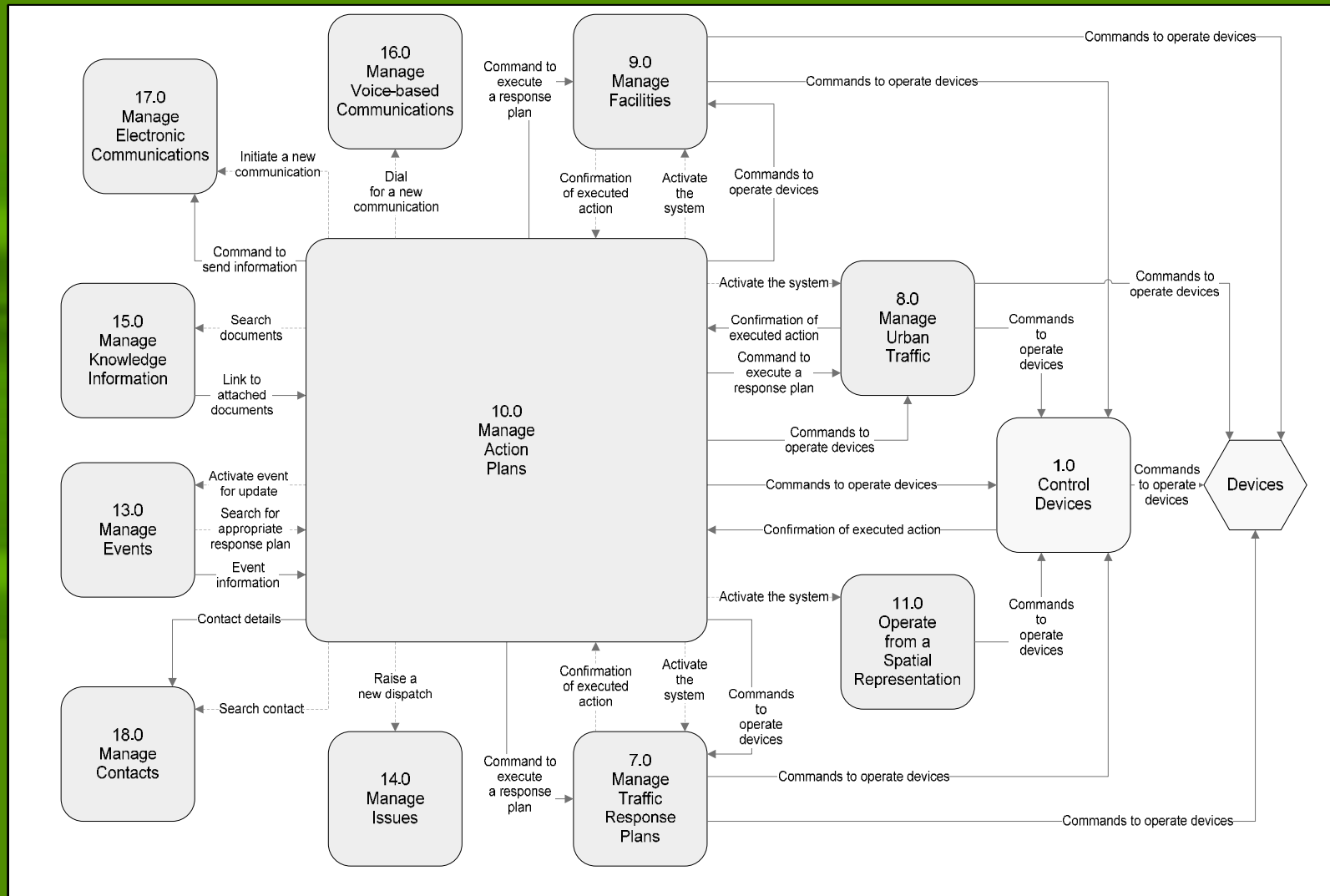
Data Repositories



THE ROLE OF BUSINESS INTELLIGENCE IN DEFINING ROLES AND FUNCTIONS

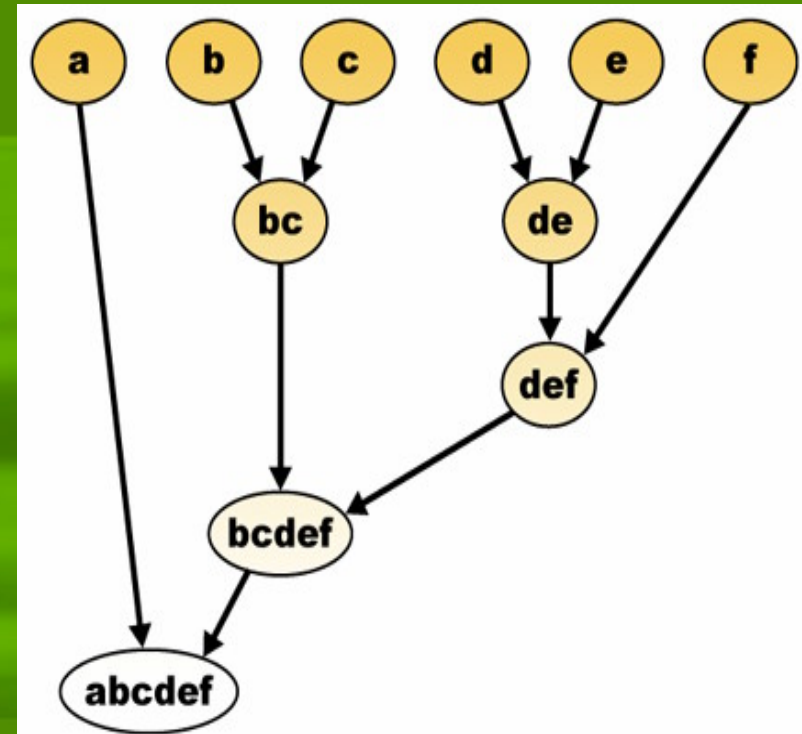
- Business analysis is required to obtain the right approach to developing an ITS functional architecture.
- Business analysis for operational ITS systems should focus on the role of the Operators and the inter-related sets of functions that the Roading Authority requires of them.
- Non functional as well as functional requirements must be captured.

THE ROLE OF BUSINESS INTELLIGENCE IN DEFINING ROLES AND FUNCTIONS



THE ROLE OF NEURAL SYSTEMS INTERCONNECTIVITY PRINCIPLES TO SUPPORT DECISION MAKING SYSTEMS DESIGN

- “Learning” systems require the ability to make dynamic interconnections between relevant underlying components and then enact relevant actions.
- “Intelligent” decision support systems must be able to learn from previous events to ensure that procedures are enacted automatically and faster the next time they are required.
- Software components need to be modular and designed to expose connectors that allow them to establish many to many relationships and execute dynamic responses and actions.



The use of Neural Processing in a Decision Support System



Graphical User Interface



Operators Act on
Intelligence

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center

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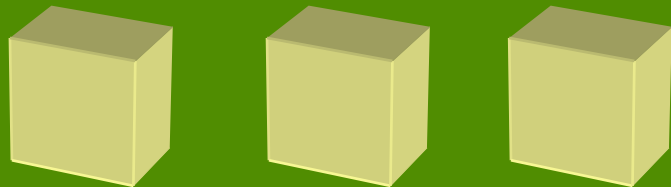
$$\frac{\sum_k u_k(x)^m x}{\sum_k u_k(x)^m}$$

Common Communications Layer + Protocols

SNMP Open MIBS



Physical Communications Layer



Road Side ITS Devices

Incident Processing Logic

Fault Management Logic

Motorway Management



Data Repositories



CONCLUSIONS

- **The future for more “Intelligent” Transportation Systems lies in enabling technologies that will allow operators to focus on priority issues whilst business as usual activities become increasingly fully automated.**
- **Decision making from a network management point of view is also likely to become nearly fully automated.**
- **Decision support systems and ATMS software should be based around commonly available off the shelf operating systems.**

Questions

