

Applying Systems Engineering to Operational System Improvements

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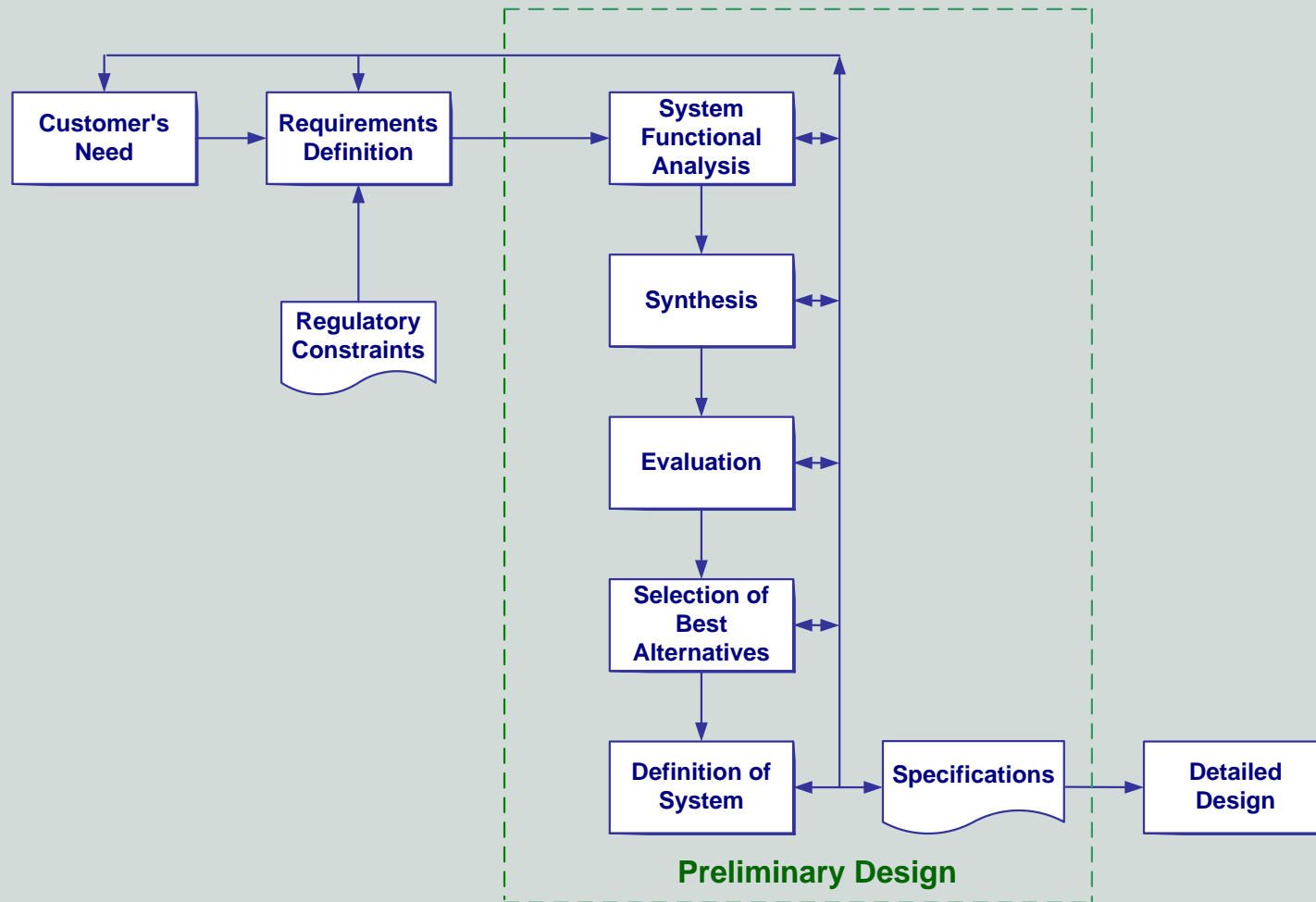
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- **Current need to reduce cost while improving performance of Legacy Systems**
- **Definition of Classic Systems Engineering Process**
- **Example application and Case Study**
- **Where to from here?**





CLASSIC SYSTEMS ENGINEERING PROCESS



An orderly approach to meeting customer needs through detailed design.



POTENTIAL APPLICATIONS





CASE STUDY: TAXI CAB

- **Company Objective: Increase Profitability**
- **Approach: Systems Engineering**
- **Facts: 100 Vehicles, 75,000 Miles/Year/Vehicle
200 Drivers, Management, Dispatch,
Advertising, Health Insurance, Auto
Insurance, Vehicle Support (Repair,
Fuel, etc.)**



REQUIREMENTS



*Full set of requirements
constrain the
solution space.*



BASELINE COST ESTIMATE

***Appropriate
cost elements
for the
particular
customer***

Cost Element	Cost / Year
Total Cost	\$10,500,000
Total Labor	\$4,340,000
Driver	\$3,200,000
Dispatch	\$140,000
Management	\$1,000,000
Fuel	\$1,500,000
Maintenance	\$1,200,000
Vehicles	\$700,000
Equipment	\$500,000
Insurance	\$1,156,000
Health	\$856,000
Auto	\$300,000
Vehicle Replacement	\$500,000
Advertising	\$52,000
Miscellaneous Cost (Rent, Utilities, etc.)	\$1,752,000



ALTERNATIVES BY FUNCTION

➤ Support

- Smaller Cars
- Electric Cars
- Repair Contract
- Run to Fail
- Etc.

➤ Insurance

- Self Insured Drivers
- Negotiate with Insurance Companies
- Hire Lawyers
- Liability Only
- Etc.

➤ Driver Function

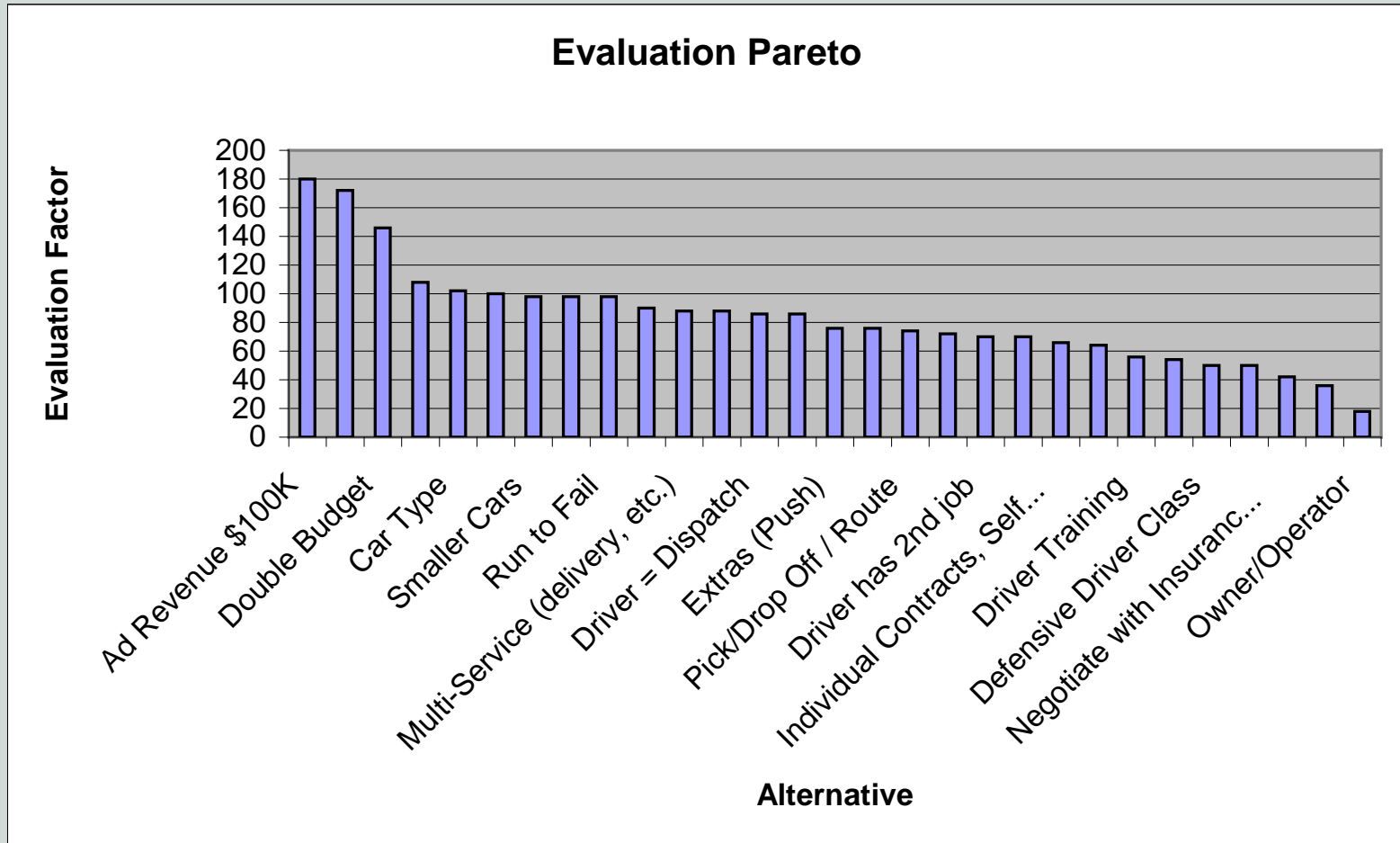
- Defensive Driver Class
- Work for Tips Only
- Robotic Driver
- Pull Off & Wait
- Etc.

➤ Advertising

- Utilize Car In/Out
- More Trips
- Double Budget
- New Media Outlet
- Etc.

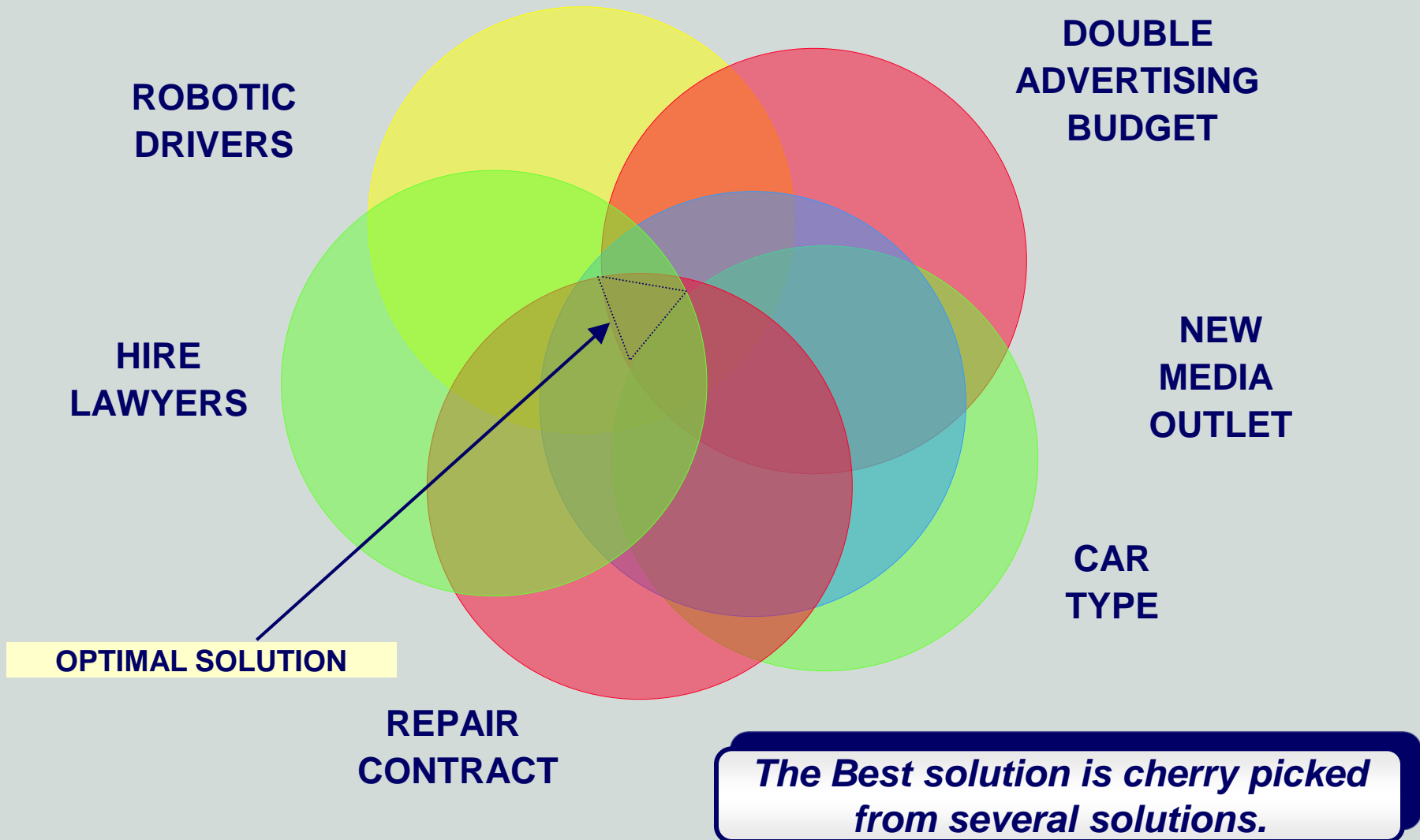
Broader analysis provides a wider range of opportunities.

ALTERNATIVE ANALYSIS



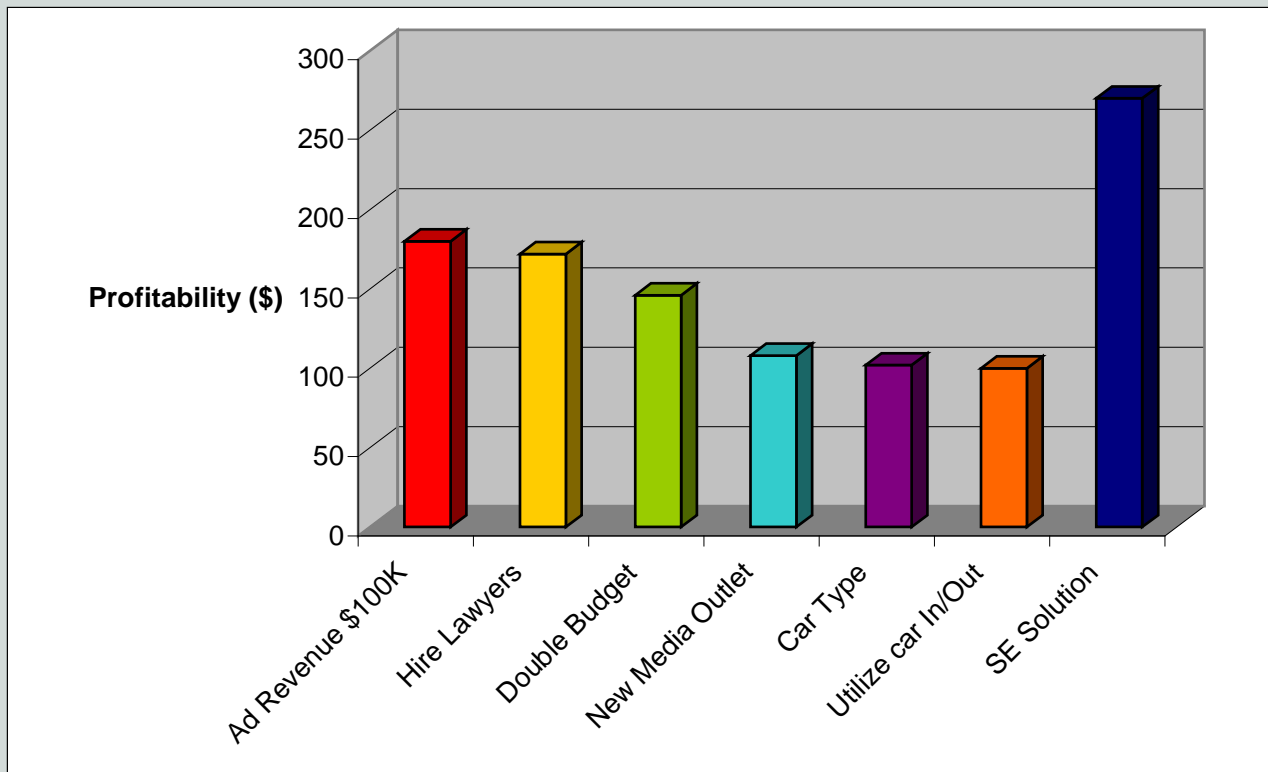
Concentrate on high cost centers.

EVALUATION



RESULTS

Systems approach yields a better solution than any individual fix.



Systems Engineering solutions are typically two to three times better at meeting objectives.



WHERE TO FROM HERE?

**How to train Systems Engineering practitioners
to work in legacy world.**

Are you fired up, ready to go?

Fired up, ready to go?

Fired up, ready to go?

Fired up, ready to go?