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Using the “Bounding Box” to Accelerate Product Development

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Key Questions

- Why introduce a new tool?
- What's the bounding box?
- How does the bounding box accelerate product development?
- How does it work?
- What makes a good bounding box?
- How does the bounding box help?
- Lessons learned at Tektronix



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Why introduce the bounding box tool?

- Program complexity
 - Many internal and external factors are critical to success
 - Need better tools for simplifying, communicating, and focusing on the key success factors.
- Dynamic and unpredictable environments
 - Using the best practices and lessons learned from past projects is important but not sufficient.
 - Need better tools for anticipating change and for adapting quickly.
- Time-to-market - especially in the early phases
 - Current management tools work best at controlling after the objectives are set and the plans are in place.
 - Need better tools for managing before teams and management have “all” the information.



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What is the bounding box?

- The zone within which a program team can operate:
 - Within these boundaries, the team and management agree that the program is on-track.
 - Outside the boundaries, team escalates issues or decisions to management.
 - As long as the program is “in-bounds” or within the zone, the team makes the day-to-day decisions and adjustments.



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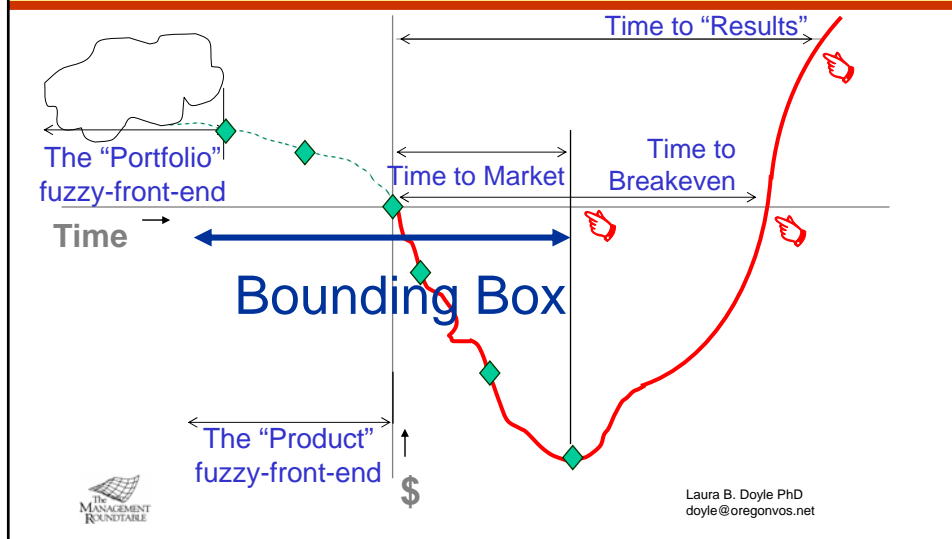
What is the bounding box?

- Bounding Process
 - Parameters established during initial development phase through a negotiation process and approved with charter approval.
 - Team and management agree up-front on boundaries and what happens when the team is out-of-bounds.
 - Regular project reporting uses the program bounding box to report status (stop-light or dash-board reporting).



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When to use? Product Life Cycle?



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What kind of Boundaries? Bounding Box Template

Value Proposition/Target Market	Product Development Decisions & Options
Business Strategy Alignment	Risk Mitigation
Market Window & Size	Customer Driven Milestones & Schedule
Lead Customers & Prototype Approach	Financial/Resource Assumptions
High-Level Customer Needs	Competitive Overview
Unknowns & Risk Reduction Results	Team Requirements



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How does the bounding box accelerate product development? (1)

- Program complexity
 - Boundaries reflect the top few risks, success factors.
 - Boundaries are objective and measurable.
 - Team and management roles in the decision-making and escalation processes are clarified up-front.



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How does the bounding box accelerate product development? (2)

- Dynamic and unpredictable environments
 - Boundaries are program-specific.
 - Team and management agree up-front; anticipate and prepare for change.
 - When key success factors are impacted, management and team act with urgency.



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How does the bounding box accelerate product development? (3)

- Time-to-market — especially in the early phases
 - Teams can move forward within constraints while still gathering information and setting objectives.
 - Role and responsibility clarity allows teams to make adjustments within boundaries; avoids unnecessary escalation.



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Bounding Box Example

Value Proposition/Target Market

Minimum offering value supports customer's implementation of new protocol.

Market Window & Size

Market window timing changes less than +/- 3 months.

Lead Customers & Prototype Approach

Deliver first beta release to one lead customer by January 02.

Product Development Decisions & Options

Interface module decisions made before August 30, 2001.



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Bounding Box Example (cont)

Team Requirements for Execution

- Complete team staff is identified before July 31, 2001.
- Software architecture team is on-board 100% by August 30, 2001.

Financial/Resource Assumptions/Forecast

- Manufacturing cost of sales is less than +25% of plan.
- Engineering expense is less than +25% of plan.



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What are the key characteristics of a good bounding box?

- The critical few success factors: external and internal.
- Boundary complexity scaled to program.
- Boundaries as objective and measurable as possible
- Definition of “in-bounds” and “out-of-bounds” agreed upon as part of approval process.
- Team feels empowered “within the box.”
- Management is ready to get involved “outside the box.”



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What else do you need to make the bounding box work well?

- Boundary monitoring
- Regular management reporting on program status — using the bounding box tool
- Team empowerment within/initiative to escalate if “out”
- Quick and appropriate management response
- Flexibility and willingness to adjust boundaries — especially when learning
- Expectation that team will go “out-of-bounds”



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Case study: Nebraska Project what was it?

- Product update to reduce costs and improve performance
- <\$1.5M program but affected many existing products
- Availability affected success of another program
- 2-site engineering program
- 9-month duration



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Nebraska bounding box as first proposed (1)

- **Product Features & Functionality**
 - 1300 and 1550 Laser versions, External Tunable laser input, Two Receive Data Electrical Outputs
- **Internal Milestones & Schedule**
 - Not to exceed product ship release March 2002
- **Customer Driven Milestones & Schedule**
 - Public announcement TBD by 08-31-01
 - Availability for BB product TBD by 08-31-01



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Nebraska bounding box as first proposed (2)

Financial Performance

Calculate following metrics at least every other AP:

- Maximum Total NR Cash Flow \$ 1.2M
- Min total net sales \$ 35M
- Min GM @ Product Ship Release 70%
- Maximum capital cost \$ 150K

MCOS Goal:

v(15)	\$ 15,300
v(13)	\$ 12,750
x6	\$ 4,200
x7	\$ 13,800
Etc.	



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Nebraska bounding box + 9 months (1)

Product Features & Functionality

- 1300 and 1550 Laser versions, External Tunable laser input, Two Receive Data Electrical Outputs

Internal Milestones & Schedule

- Not to exceed product ship release **June 2002**

Customer Driven Milestones & Schedule

- Public announcement **30 days before June 2002**
- Availability for BB product **June 2002**



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Nebraska bounding box + 9 months (2)

Financial Performance

Calculate following metrics at least every other AP:

- Maximum Total NR Cash Flow \$ 1.6M
- ✗ • Min total net sales \$ 20M
- Min GM @ Product Ship Release 70%
- Maximum capital cost \$ 150K
- Min Profitability Index 2.7 (with sunk cost)

	<u>MCOS Goal:</u>	<u>MCOS Actual (11%)</u>
v(15)	\$ 15,850	\$ 15,787
v(13)	\$ 13,300	\$ 10,146
x6	\$ 5,500	\$ 5,342
x7	\$ 14,300	\$ 13,685
Etc.		



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Lessons Learned

- Focus on the top priority success factors or risks.
- Agree up-front.
- Keep it simple.
- Engage the team.
- Use the bounding box to communicate.
- Be open to changing boundaries as you learn.
- Take “out-of-bounds” seriously.



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How does the bounding box help accelerate product development?

- Helps team and management simplify and focus on the critical few issues.
- Builds common understanding of scope, roles, and issues up-front to speed problem-solving later.
- Helps get new programs moving more quickly in the early stages.
- Accelerates learning and product development improvement across the organization.



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Q & A



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