Project Management: Concepts, Techniques, and Applications

2015 Marshall University
SAME-ASCE Winter Technical Conference
Ryland Wayne Musick, Jr., M.S., P.E.
January 22, 2015
Presentation Topics

- “Macro” Project Management (Program Management)
- Communication
- Quadrant Living
- How to Conduct Meetings
- Work Breakdown Structures

Presentation Topics

- Network Diagram
- Gantt Chart
- Resource Histogram
- Project Crashing

Dr. Eldon R. Larsen, Ph.D., PMP

http://www.marshall.edu/cite/home/academic/divisions/wde/engrfac/
Project Management in the WVDOH?

http://technology.infomine.com/ProjectManagement/ProjectManagement_files/image004.jpg
“Macro” Project Management (Program Management)

- As Designers, you are at the core of our State and Federal-Aid Programs.

- Without you, the Programs do not get delivered.

- Designers oftentimes forget their worth – **V A L U A B L E.**
“Macro” Project Management (Program Management)

- In our District Design Sections and development Divisions, how many of you feel you have enough staff to adequately meet the current schedule of projects?

- If not, what kind of help can we assist you in receiving?

- Project Schedules

- Schedule and Cost Changes

- Cash Flow $$$$
“Macro” Project Management (Program Management)

- Please help the Programming Division to keep all of the project records straight.

- Please work with the Regional Program Managers for all of your Programming Division needs.
“Macro” Project Management (Program Management) Regional Program Managers

Beth Fox
Districts 3 and 7
(304) 415-9302

Elizabeth Lilly
District 2
(304) 558-9602

Eva Melancon
District 1
(304) 558-9611
“Macro” Project Management
(Program Management)
Regional Program Managers

Mike Adkins
Districts 9 and 10
(304) 487-5286

A.J. Bernatowicz
Districts 4 and 6
(304) 329-0192

Ben Shaffer
Districts 5 and 8
(304) 591-3812
Communication (Larsen)

Definition of “communication”

The process of becoming “like one” or “as one.”
Communication (Larsen)

Figure 1. Transforming People from a State of Misalignment to High Degree of Alignment
Communication (Larsen)

Figure 2. The Effective Communication Process Model

- **Person A** (Sender & Receiver)
- **Person B** (Sender & Receiver)
- **Encoding**
- **Decoding**
- **Message**
- **Medium**

Founded upon mutual **caring and alignment**

Background noise exists throughout the process
Quadrant Living - Home

<table>
<thead>
<tr>
<th>Important</th>
<th>Urgent</th>
<th>Not Urgent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quad I</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Activities</strong></td>
<td>Crisis</td>
<td>Prevention, capability improvement</td>
</tr>
<tr>
<td></td>
<td>Pressing Problems</td>
<td>Relationship building</td>
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<tr>
<td></td>
<td>Deadline Driven</td>
<td>Recognizing new opportunities</td>
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<tr>
<td><strong>Results</strong></td>
<td>Stress</td>
<td>Planning, recreation</td>
</tr>
<tr>
<td></td>
<td>Burn-out</td>
<td></td>
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<tr>
<td></td>
<td>Crisis management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Always putting out fires</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Not Important</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quad III</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Activities</strong></td>
<td>Intermittuations, some callers</td>
<td>Total irresponsibility</td>
</tr>
<tr>
<td></td>
<td>Some email, some reports</td>
<td>Fired from jobs</td>
</tr>
<tr>
<td></td>
<td>Some meetings</td>
<td>Dependent on others or institutions for basics</td>
</tr>
<tr>
<td></td>
<td>Proximate, pressing matters</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Popular activities</td>
<td></td>
</tr>
<tr>
<td><strong>Results</strong></td>
<td>Short term focus</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Crisis management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reputation – chameleon character</td>
<td></td>
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<tr>
<td></td>
<td>See goals/ plans as worthless</td>
<td></td>
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<tr>
<td></td>
<td>Feel victimized, out of control</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shallow or broken relationships</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th><strong>Quad II</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activities</strong></td>
<td>Vision, perspective</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Balance</td>
<td></td>
</tr>
<tr>
<td><strong>Results</strong></td>
<td>Discipline</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Few crisis</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th><strong>Quad IV</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activities</strong></td>
<td>Trivia, busy work</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Some email</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Personal social media</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Some phone calls</td>
<td></td>
</tr>
<tr>
<td><strong>Results</strong></td>
<td>Time wasters</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pleasant activities</td>
<td></td>
</tr>
</tbody>
</table>

http://amilya.com/stephen-covey-4-quadrants/
Quadrant Living – Work (Larsen)

I RESULTS:
- Stress
- Burnout
- Crisis management
- Always putting out fires

III RESULTS:
- Short-term focus
- Crisis management
- Reputation-chameleon character
- See goals and plans as worthless
- Feel victimized, out of control
- Shallow or broken relationships

RESULTS:
- Vision, perspective
- Balance
- Discipline
- Control
- Few Crises

- Total irresponsibility
- Fired from jobs
- Dependent on others or institutions for basics

Project Management Training—ERL
Meetings (Larsen)

- Identify the meeting objective, write down, and pass it out to everyone that is invited to the meeting.

- Have a clear agenda that has been agreed to by all prior to the meeting.

- Set an established start time and end time, and treat them as a contract.

- Prepare for the meeting and be ready, in content as well as in process.

- Establish the ground rules of conduct and order, changeable only by the group by consensus.
Meetings (Larsen)

- Understand the meaning of the word communication and apply it well continuously before, during, and after the meeting.

- Teach the members involved in the meeting to listen empathically.

- Create a supportive and task-oriented environment during the meeting.

- Close the meeting properly.

- Follow up.
Work Breakdown Structures (WBS)

http://www.criticaltools.com/projwbs.htm/
Work Breakdown Structures (Larsen)

- The most important but the least used by untrained project managers.

- Rules of Work Breakdown Structures
  - No chronological order vertically in WBS.
  - Break tasks down to the level that a specific resource can be identified.
  - Break tasks down to where it is useful.
Work Breakdown Structures (Larsen)

- Rules of Work Breakdown Structures
  - Always use action verbs to describe lowest-level tasks.
  - Never break one task into only one task.
  - Make task descriptions so they stand alone from the structure.
  - The lowest-level tasks shall be easily estimated.
Network Diagram (Larsen)

Objective: To Determine the Critical Path
Gantt Chart (Larsen)

- Critical path is displayed in red.
- Arrows represent interdependencies.
- Early Start and Early Finish
- Black lines represent Slack
Resource Histogram

http://excelmaster.co/excel-how-to/resource-histogram/
Resource Histogram (Larsen)

- Benefits of a resource histogram:
  - Ability to move your workload to level your resources
  - Ability to predict financial expenditures for resources
## Project Crashing (Larsen)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Immediate Predecessors</th>
<th>Duration, days</th>
<th>Cost, $</th>
<th>Duration, days</th>
<th>Cost, $</th>
<th>Additional (Crash) Cost/day, $/day</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>-</td>
<td>28</td>
<td>$ 12,000</td>
<td>24</td>
<td>$ 16,000</td>
<td>$ 1,000</td>
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<tr>
<td>B</td>
<td>-</td>
<td>32</td>
<td>$ 28,000</td>
<td>28</td>
<td>$ 40,000</td>
<td>$ 3,000</td>
</tr>
<tr>
<td>C</td>
<td>-</td>
<td>28</td>
<td>$ 8,000</td>
<td>24</td>
<td>$ 12,000</td>
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<tr>
<td>D</td>
<td>A</td>
<td>24</td>
<td>$ 28,000</td>
<td>12</td>
<td>$ 76,000</td>
<td>$ 4,000</td>
</tr>
<tr>
<td>E</td>
<td>B</td>
<td>12</td>
<td>$ 20,000</td>
<td>4</td>
<td>$ 36,000</td>
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<tr>
<td>F</td>
<td>B</td>
<td>36</td>
<td>$ 36,000</td>
<td>28</td>
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<tr>
<td>G</td>
<td>C</td>
<td>24</td>
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<td>12</td>
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<tr>
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<tr>
<td>J</td>
<td>G</td>
<td>20</td>
<td>$ 4,000</td>
<td>8</td>
<td>$ 16,000</td>
<td>$ 1,000</td>
</tr>
</tbody>
</table>

**Total Normal Cost Without Crashing = $ 176,000**
Project Crashing (Larsen)

Why “crash” a project?
- When the project time needs to be shortened
- When tasks done in series are done in parallel
- Scope is reduced
- Modular or prefabrication desired
Project Crashing

After Crashing Activity A
ADHI = 80 days (Critical Path After Crashing)  Cost of Project = $180,000
BEHI = 76 days
BFI = 80 days (Critical Path After Crashing)
CGJ = 72 days

A = 24 days = $16,000
B = 32 days = $28,000
C = 28 days = $8,000
D = 24 days = $28,000
E = 12 days = $20,000
F = 36 days = $36,000
G = 24 days = $12,000
H = 20 days = $24,000
I = 12 days = $4,000
J = 20 days = $4,000
Questions

Thank You!!

http://blog.examprofessor.com/