

**CONVENTIONAL &  
INNOVATIVE  
TECHNIQUES OF  
PROJECT MANAGEMENT**

Dr. Kusum Lata

# Project Management –Tools and Techniques

---

- **Tools & Tech on the basis of processes involved in PM** (PMBOK ed.6, 2017)
- **Data gathering techniques.** Used to collect data and information from a variety of sources. There are nine data gathering tools and techniques.
- **Data analysis techniques.** Used to organize, assess, and evaluate data and information. There are 27 data analysis tools and techniques.
- **Data representation techniques.** Used to show graphic representations or other methods used to convey data and information. There are 15 data representation tools and techniques.

# Tools and Techniques

---

- Decision-making techniques. Used to select a course of action from different alternatives. There are two decision-making tools and techniques.
- Communication skills. Used to transfer information between stakeholders. There are 2 communication skills tools and techniques.
- Interpersonal and team skills. Used to effectively lead and interact with team members and other stakeholders. There are 17 interpersonal and team skills tools and techniques.
- Additionally, there are 60 ungrouped tools & techniques
- Next 10 slides are on Categorization & Index of Tools & Techniques as per their use in 10 Knowledge Areas as described in the PMBOK

Table X6-1. Categorization and Index of Tools and Techniques

| Tool and Technique                         | Knowledge Area <sup>A</sup> |            |          |      |            |           |               |                                 |             |             |
|--------------------------------------------|-----------------------------|------------|----------|------|------------|-----------|---------------|---------------------------------|-------------|-------------|
|                                            | Integration                 | Scope      | Schedule | Cost | Quality    | Resources | Communication | Risk                            | Procurement | Stakeholder |
| <b>Data Gathering Tools and Techniques</b> |                             |            |          |      |            |           |               |                                 |             |             |
| Benchmarking                               |                             | 5.2        |          |      | <b>8.1</b> |           |               |                                 |             | 13.2        |
| Brainstorming                              | <b>4.1</b> , 4.2            | 5.2        |          |      | 8.1        |           |               | 11.2                            |             | 13.1        |
| Check sheets                               |                             |            |          |      | <b>8.3</b> |           |               |                                 |             |             |
| Checklists                                 | 4.2                         |            |          |      | 8.2, 8.3   |           |               | <b>11.2</b>                     |             |             |
| Focus groups                               | 4.1, 4.2                    | <b>5.2</b> |          |      |            |           |               |                                 |             |             |
| Interviews                                 | 4.1, 4.2                    | <b>5.2</b> |          |      | 8.1        |           |               | 11.2,<br>11.3,<br>11.4,<br>11.5 |             |             |
| Market research                            |                             |            |          |      |            |           |               |                                 | <b>12.1</b> |             |
| Questionnaires and surveys                 |                             | <b>5.2</b> |          |      |            |           |               |                                 |             | 13.1        |
| Statistical sampling                       |                             |            |          |      | <b>8.3</b> |           |               |                                 |             |             |

<sup>A</sup> The boldface entries indicate the section numbers of the processes where a tool or technique is described.

Table X6-1. Categorization and Index of Tools and Techniques (cont.)

| Tool and Technique                        | Knowledge Area <sup>A</sup> |            |            |            |            |                  |               |             |             |             |
|-------------------------------------------|-----------------------------|------------|------------|------------|------------|------------------|---------------|-------------|-------------|-------------|
|                                           | Integration                 | Scope      | Schedule   | Cost       | Quality    | Resources        | Communication | Risk        | Procurement | Stakeholder |
| <b>Data Analysis Tools and Techniques</b> |                             |            |            |            |            |                  |               |             |             |             |
| Alternatives analysis                     | 4.5, 4.6                    | 5.1, 5.4   | 6.1, 6.4   | 7.1, 7.2   | 8.2        | <b>9.2</b> , 9.6 |               | 11.5        |             | 13.4        |
| Assessment of other risk parameters       |                             |            |            |            |            |                  |               | <b>11.3</b> |             |             |
| Assumption and constraint analysis        |                             |            |            |            |            |                  |               | <b>11.2</b> |             |             |
| Cost of quality                           |                             |            |            | 7.2        | <b>8.1</b> |                  |               |             |             |             |
| Cost-benefit analysis                     | 4.5, 4.6                    |            |            |            | <b>8.1</b> | 9.6              |               | 11.5        |             |             |
| Decision tree analysis                    |                             |            |            |            |            |                  |               | <b>11.4</b> |             |             |
| Document analysis                         | 4.7                         | <b>5.2</b> |            |            | 8.2        |                  |               | 11.2        |             | 13.1        |
| Earned value analysis                     | 4.5                         |            | 6.6        | <b>7.4</b> |            |                  |               |             | 12.3        |             |
| Influence diagrams                        |                             |            |            |            |            |                  |               | <b>11.4</b> |             |             |
| Iteration burndown chart                  |                             |            | <b>6.6</b> |            |            |                  |               |             |             |             |
| Make-or-buy analysis                      |                             |            |            |            |            |                  |               |             | <b>12.1</b> |             |
| Performance reviews                       |                             |            | <b>6.6</b> |            | 8.3        | 9.6              |               |             | 12.3        |             |
| Process analysis                          |                             |            |            |            | <b>8.2</b> |                  |               |             |             |             |
| Proposal evaluation                       |                             |            |            |            |            |                  |               |             | <b>12.2</b> |             |

Table X6-1. Categorization and Index of Tools and Techniques (cont.)

| Tool and Technique                                | Knowledge Area <sup>A</sup> |            |                 |                      |                 |           |               |             |             |                   |
|---------------------------------------------------|-----------------------------|------------|-----------------|----------------------|-----------------|-----------|---------------|-------------|-------------|-------------------|
|                                                   | Integration                 | Scope      | Schedule        | Cost                 | Quality         | Resources | Communication | Risk        | Procurement | Stakeholder       |
| <b>Data Analysis Tools and Techniques (cont.)</b> |                             |            |                 |                      |                 |           |               |             |             |                   |
| Regression analysis                               |                             | <b>4.7</b> |                 |                      |                 |           |               |             |             |                   |
| Reserve analysis                                  |                             |            | 6.4             | <b>7.2, 7.3, 7.4</b> |                 |           |               | 11.6        |             |                   |
| Risk data quality assessment                      |                             |            |                 |                      |                 |           |               | <b>11.3</b> |             |                   |
| Risk probability and impact assessment            |                             |            |                 |                      |                 |           |               | <b>11.3</b> |             |                   |
| Root cause analysis                               | 4.5                         |            |                 |                      | <b>8.2, 8.3</b> |           |               | 11.2        |             | 13.2, 13.4        |
| Sensitivity analysis                              |                             |            |                 |                      |                 |           |               | <b>11.4</b> |             |                   |
| Simulation                                        |                             |            | 6.5             |                      |                 |           |               | <b>11.4</b> |             |                   |
| Stakeholder analysis                              |                             |            |                 |                      |                 |           |               | 11.1        |             | <b>13.1, 13.4</b> |
| SWOT analysis                                     |                             |            |                 |                      |                 |           |               | <b>11.2</b> |             | 13.2              |
| Technical performance analysis                    |                             |            |                 |                      |                 |           |               | <b>11.7</b> |             |                   |
| Trend analysis                                    | <b>4.5, 4.7</b>             | 5.6        | 6.6             | 7.4                  |                 | 9.6       |               |             | 12.3        |                   |
| Variance analysis                                 | <b>4.5, 4.7</b>             | 5.6        | 6.6             | 7.4                  |                 |           |               |             |             |                   |
| What-if scenario analysis                         |                             |            | <b>6.5, 6.6</b> |                      |                 |           |               |             |             |                   |

Table X6-1. Categorization and Index of Tools and Techniques (cont.)

| Tool and Technique                               | Knowledge Area <sup>A</sup> |          |          |      |          |           |               |      |             |             |
|--------------------------------------------------|-----------------------------|----------|----------|------|----------|-----------|---------------|------|-------------|-------------|
|                                                  | Integration                 | Scope    | Schedule | Cost | Quality  | Resources | Communication | Risk | Procurement | Stakeholder |
| <b>Data Representation Tools and Techniques</b>  |                             |          |          |      |          |           |               |      |             |             |
| Affinity diagrams                                |                             | 5.2      |          |      | 8.2      |           |               |      |             |             |
| Cause-and-effect diagrams                        |                             |          |          |      | 8.2, 8.3 |           |               |      |             |             |
| Control charts                                   |                             |          |          |      | 8.3      |           |               |      |             |             |
| Flowcharts                                       |                             |          |          |      | 8.1, 8.2 |           |               |      |             |             |
| Hierarchical charts                              |                             |          |          |      |          | 9.1       |               |      |             |             |
| Histograms                                       |                             |          |          |      | 8.2, 8.3 |           |               |      |             |             |
| Logical data model                               |                             |          |          |      | 8.1      |           |               |      |             |             |
| Matrix diagrams                                  |                             |          |          |      | 8.1, 8.2 |           |               |      |             |             |
| Matrix-based charts                              |                             |          |          |      |          | 9.1       |               |      |             |             |
| Mind mapping                                     |                             | 5.2      |          |      | 8.1      |           |               |      |             | 13.2        |
| Probability and impact matrix                    |                             |          |          |      |          |           |               | 11.3 |             |             |
| Scatter diagrams                                 |                             |          |          |      | 8.2, 8.3 |           |               |      |             |             |
| Stakeholder engagement assessment matrix         |                             |          |          |      |          |           | 10.1, 10.3    |      |             | 13.2, 13.4  |
| Stakeholder mapping/ representation              |                             |          |          |      |          |           |               |      |             | 13.1        |
| Text-oriented formats                            |                             |          |          |      |          | 9.1       |               |      |             |             |
| <b>Decision-Making Tools and Techniques</b>      |                             |          |          |      |          |           |               |      |             |             |
| Multicriteria decision analysis                  | 4.6                         | 5.2, 5.3 |          |      | 8.1, 8.2 | 9.3       |               | 11.5 |             | 13.4        |
| Voting                                           | 4.5, 4.6                    | 5.2, 5.5 | 6.4      | 7.2  |          |           |               |      |             | 13.4        |
| <b>Communication Skills Tools and Techniques</b> |                             |          |          |      |          |           |               |      |             |             |
| Feedback                                         |                             |          |          |      |          |           | 10.2          |      |             | 13.4        |
| Presentations                                    |                             |          |          |      |          |           | 10.2          |      |             | 13.4        |

**Table X6-1. Categorization and Index of Tools and Techniques (cont.)**

| Tool and Technique                                        | Knowledge Area <sup>A</sup> |            |          |      |         |                          |                       |                                 |             |               |
|-----------------------------------------------------------|-----------------------------|------------|----------|------|---------|--------------------------|-----------------------|---------------------------------|-------------|---------------|
|                                                           | Integration                 | Scope      | Schedule | Cost | Quality | Resources                | Communication         | Risk                            | Procurement | Stakeholder   |
| <b>Interpersonal and Team Skills Tools and Techniques</b> |                             |            |          |      |         |                          |                       |                                 |             |               |
| Active listening                                          | 4.4                         |            |          |      |         |                          | <b>10.2</b>           |                                 |             | 13.4          |
| Communication styles assessment                           |                             |            |          |      |         |                          | <b>10.1</b>           |                                 |             |               |
| Conflict management                                       | 4.1, 4.2                    |            |          |      |         | 9.4, <b>9.5</b>          | 10.2                  |                                 |             | 13.3          |
| Cultural awareness                                        |                             |            |          |      |         |                          | <b>10.1</b> ,<br>10.2 |                                 |             | 13.3,<br>13.4 |
| Decision making                                           |                             |            |          |      |         | <b>9.5</b>               |                       |                                 |             |               |
| Emotional intelligence                                    |                             |            |          |      |         | <b>9.5</b>               |                       |                                 |             |               |
| Facilitation                                              | <b>4.1</b> , 4.2,<br>4.4    | 5.2, 5.3   |          |      |         |                          |                       | 11.2,<br>11.3,<br>11.4,<br>11.5 |             |               |
| Influencing                                               |                             |            |          |      |         | 9.4, <b>9.5</b> ,<br>9.6 |                       | 11.6                            |             |               |
| Leadership                                                | 4.4                         |            |          |      |         | <b>9.5</b>               |                       |                                 |             | 13.4          |
| Meeting management                                        | 4.1, 4.2                    |            |          |      |         |                          | <b>10.2</b>           |                                 |             |               |
| Motivation                                                |                             |            |          |      |         | <b>9.4</b>               |                       |                                 |             |               |
| Negotiation                                               |                             |            |          |      |         | 9.3, 9.4,<br>9.6         |                       |                                 | <b>12.2</b> | 13.3          |
| Networking                                                | 4.4                         |            |          |      |         |                          | <b>10.2</b>           |                                 |             | 13.4          |
| Nominal group technique                                   |                             | <b>5.2</b> |          |      |         |                          |                       |                                 |             |               |
| Observation/ conversation                                 |                             | <b>5.2</b> |          |      |         |                          | 10.3                  |                                 |             | 13.3          |
| Political awareness                                       | 4.4                         |            |          |      |         |                          | <b>10.1</b> ,<br>10.2 |                                 |             | 13.3,<br>13.4 |
| Team building                                             |                             |            |          |      |         | <b>9.4</b>               |                       |                                 |             |               |



Table X6-1. Categorization and Index of Tools and Techniques (cont.)

| Tool and Technique                                        | Knowledge Area <sup>A</sup> |            |          |      |         |                          |                       |                                 |             |               |
|-----------------------------------------------------------|-----------------------------|------------|----------|------|---------|--------------------------|-----------------------|---------------------------------|-------------|---------------|
|                                                           | Integration                 | Scope      | Schedule | Cost | Quality | Resources                | Communication         | Risk                            | Procurement | Stakeholder   |
| <b>Interpersonal and Team Skills Tools and Techniques</b> |                             |            |          |      |         |                          |                       |                                 |             |               |
| Active listening                                          | 4.4                         |            |          |      |         |                          | <b>10.2</b>           |                                 |             | 13.4          |
| Communication styles assessment                           |                             |            |          |      |         |                          | <b>10.1</b>           |                                 |             |               |
| Conflict management                                       | 4.1, 4.2                    |            |          |      |         | 9.4, <b>9.5</b>          | 10.2                  |                                 |             | 13.3          |
| Cultural awareness                                        |                             |            |          |      |         |                          | <b>10.1</b> ,<br>10.2 |                                 |             | 13.3,<br>13.4 |
| Decision making                                           |                             |            |          |      |         | <b>9.5</b>               |                       |                                 |             |               |
| Emotional intelligence                                    |                             |            |          |      |         | <b>9.5</b>               |                       |                                 |             |               |
| Facilitation                                              | <b>4.1</b> , 4.2,<br>4.4    | 5.2, 5.3   |          |      |         |                          |                       | 11.2,<br>11.3,<br>11.4,<br>11.5 |             |               |
| Influencing                                               |                             |            |          |      |         | 9.4, <b>9.5</b> ,<br>9.6 |                       | 11.6                            |             |               |
| Leadership                                                | 4.4                         |            |          |      |         | <b>9.5</b>               |                       |                                 |             | 13.4          |
| Meeting management                                        | 4.1, 4.2                    |            |          |      |         |                          | <b>10.2</b>           |                                 |             |               |
| Motivation                                                |                             |            |          |      |         | <b>9.4</b>               |                       |                                 |             |               |
| Negotiation                                               |                             |            |          |      |         | 9.3, 9.4,<br>9.6         |                       |                                 | <b>12.2</b> | 13.3          |
| Networking                                                | 4.4                         |            |          |      |         |                          | <b>10.2</b>           |                                 |             | 13.4          |
| Nominal group technique                                   |                             | <b>5.2</b> |          |      |         |                          |                       |                                 |             |               |
| Observation/<br>conversation                              |                             | <b>5.2</b> |          |      |         |                          | 10.3                  |                                 |             | 13.3          |
| Political awareness                                       | 4.4                         |            |          |      |         |                          | <b>10.1</b> ,<br>10.2 |                                 |             | 13.3,<br>13.4 |
| Team building                                             |                             |            |          |      |         | <b>9.4</b>               |                       |                                 |             |               |

Table X6-1. Categorization and Index of Tools and Techniques (cont.)

| Tool and Technique                    | Knowledge Area <sup>A</sup> |            |                 |            |            |            |                      |             |             |             |
|---------------------------------------|-----------------------------|------------|-----------------|------------|------------|------------|----------------------|-------------|-------------|-------------|
|                                       | Integration                 | Scope      | Schedule        | Cost       | Quality    | Resources  | Communication        | Risk        | Procurement | Stakeholder |
| <b>Ungrouped Tools and Techniques</b> |                             |            |                 |            |            |            |                      |             |             |             |
| Advertising                           |                             |            |                 |            |            |            |                      |             | <b>12.2</b> |             |
| Agile release planning                |                             |            | <b>6.5</b>      |            |            |            |                      |             |             |             |
| Analogous estimating                  |                             |            | <b>6.4</b>      | 7.2        |            | 9.2        |                      |             |             |             |
| Audits                                |                             |            |                 |            | <b>8.2</b> |            |                      | 11.7        | 12.3        |             |
| Bidder conferences                    |                             |            |                 |            |            |            |                      |             | <b>12.2</b> |             |
| Bottom-up estimating                  |                             |            | <b>6.4</b>      | 7.2        |            | 9.2        |                      |             |             |             |
| Change control tools                  | <b>4.6</b>                  |            |                 |            |            |            |                      |             |             |             |
| Claims administration                 |                             |            |                 |            |            |            |                      |             | <b>12.3</b> |             |
| Colocation                            |                             |            |                 |            |            | <b>9.4</b> |                      |             |             |             |
| Communication methods                 |                             |            |                 |            |            |            | <b>10.1,</b><br>10.2 |             |             |             |
| Communication models                  |                             |            |                 |            |            |            | <b>10.1</b>          |             |             |             |
| Communication requirements analysis   |                             |            |                 |            |            |            | <b>10.1</b>          |             |             |             |
| Communication technology              |                             |            |                 |            |            | 9.4        | <b>10.1,</b><br>10.2 |             |             |             |
| Context diagram                       |                             | <b>5.2</b> |                 |            |            |            |                      |             |             |             |
| Contingent response strategies        |                             |            |                 |            |            |            |                      | <b>11.5</b> |             |             |
| Cost aggregation                      |                             |            |                 | <b>7.3</b> |            |            |                      |             |             |             |
| Critical path method                  |                             |            | <b>6.5, 6.6</b> |            |            |            |                      |             |             |             |

Table X6-1. Categorization and Index of Tools and Techniques (cont.)

| Tool and Technique                            | Knowledge Area <sup>A</sup>               |                    |                       |                    |            |               |                          |                                    |                  |                        |
|-----------------------------------------------|-------------------------------------------|--------------------|-----------------------|--------------------|------------|---------------|--------------------------|------------------------------------|------------------|------------------------|
|                                               | Integration                               | Scope              | Schedule              | Cost               | Quality    | Resources     | Communication            | Risk                               | Procurement      | Stakeholder            |
| <b>Ungrouped Tools and Techniques (cont.)</b> |                                           |                    |                       |                    |            |               |                          |                                    |                  |                        |
| Decomposition                                 |                                           | <b>5.4</b>         | 6.3                   |                    |            |               |                          |                                    |                  |                        |
| Dependency determination and integration      |                                           |                    | <b>6.3</b>            |                    |            |               |                          |                                    |                  |                        |
| Design for X                                  |                                           |                    |                       |                    | <b>8.2</b> |               |                          |                                    |                  |                        |
| Expert judgment                               | <b>4.1</b> , 4.2, 4.3, 4.4, 4.5, 4.6, 4.7 | 5.1, 5.2, 5.3, 5.4 | 6.1, 6.2, 6.4         | 7.1, 7.2, 7.3, 7.4 | 8.1        | 9.1, 9.2      | 10.1, 10.3               | 11.1, 11.2, 11.3, 11.4, 11.5, 11.6 | 12.1, 12.2, 12.3 | 13.1, 13.2, 13.3       |
| Financing                                     |                                           |                    |                       | <b>7.3</b>         |            |               |                          |                                    |                  |                        |
| Funding limit reconciliation                  |                                           |                    |                       | <b>7.3</b>         |            |               |                          |                                    |                  |                        |
| Ground rules                                  |                                           |                    |                       |                    |            |               |                          |                                    |                  | <b>13.3</b>            |
| Historical information review                 |                                           |                    |                       | <b>7.3</b>         |            |               |                          |                                    |                  |                        |
| Individual and team assessments               |                                           |                    |                       |                    |            | <b>9.4</b>    |                          |                                    |                  |                        |
| Information management                        | <b>4.4</b>                                |                    |                       |                    |            |               |                          |                                    |                  |                        |
| Inspections                                   |                                           | 5.5                |                       |                    | <b>8.3</b> |               |                          |                                    | 12.3             | 13.3                   |
| Knowledge management                          | <b>4.4</b>                                |                    |                       |                    |            |               |                          |                                    |                  |                        |
| Leads and lags                                |                                           |                    | <b>6.3</b> , 6.5, 6.6 |                    |            |               |                          |                                    |                  |                        |
| Meetings                                      | 4.1, 4.2, 4.3, 4.5, 4.6, 4.7              | 5.1                | 6.1, 6.2, 6.4         | 7.1                | 8.1, 8.3   | 9.1, 9.2, 9.4 | <b>10.1</b> , 10.2, 10.3 | 11.1, 11.2, 11.3, 11.6             | 12.1             | 13.1, 13.2, 13.3, 13.4 |

Table X6-1. Categorization and Index of Tools and Techniques (cont.)

| Tool and Technique                            | Knowledge Area <sup>A</sup> |       |               |          |         |               |               |      |             |             |
|-----------------------------------------------|-----------------------------|-------|---------------|----------|---------|---------------|---------------|------|-------------|-------------|
|                                               | Integration                 | Scope | Schedule      | Cost     | Quality | Resources     | Communication | Risk | Procurement | Stakeholder |
| <b>Ungrouped Tools and Techniques (cont.)</b> |                             |       |               |          |         |               |               |      |             |             |
| Organizational theory                         |                             |       |               |          |         | 9.1           |               |      |             |             |
| Parametric estimating                         |                             |       | 6.4           | 7.2      |         | 9.2           |               |      |             |             |
| Pre-assignment                                |                             |       |               |          |         | 9.3           |               |      |             |             |
| Precedence diagramming method                 |                             |       | 6.3           |          |         |               |               |      |             |             |
| Problem solving                               |                             |       |               |          | 8.2     | 9.6           |               |      |             |             |
| Product analysis                              |                             | 5.3   |               |          |         |               |               |      |             |             |
| Project management information system         | 4.3                         |       | 6.3, 6.5, 6.6 | 7.2, 7.4 |         | 9.2, 9.5, 9.6 | 10.2, 10.3    | 11.6 |             |             |
| Project reporting                             |                             |       |               |          | 8.2     |               |               |      |             |             |
| Prompt lists                                  |                             |       |               |          |         |               |               | 11.2 |             |             |
| Prototypes                                    |                             | 5.2   |               |          |         |               |               |      |             |             |
| Quality improvement methods                   |                             |       |               |          | 8.2     |               |               |      |             |             |
| Recognition and rewards                       |                             |       |               |          |         | 9.4           |               |      |             |             |
| Representations of uncertainty                |                             |       |               |          |         |               |               | 11.4 |             |             |
| Resource optimization                         |                             |       | 6.5, 6.6      |          |         |               |               |      |             |             |
| Risk categorization                           |                             |       |               |          |         |               |               | 11.3 |             |             |
| Rolling wave planning                         |                             |       | 6.2           |          |         |               |               |      |             |             |

Table X6-1. Categorization and Index of Tools and Techniques (cont.)

| Tool and Technique                            | Knowledge Area <sup>A</sup> |       |                 |            |            |                 |               |             |             |             |
|-----------------------------------------------|-----------------------------|-------|-----------------|------------|------------|-----------------|---------------|-------------|-------------|-------------|
|                                               | Integration                 | Scope | Schedule        | Cost       | Quality    | Resources       | Communication | Risk        | Procurement | Stakeholder |
| <b>Ungrouped Tools and Techniques (cont.)</b> |                             |       |                 |            |            |                 |               |             |             |             |
| Schedule compression                          |                             |       | <b>6.5, 6.6</b> |            |            |                 |               |             |             |             |
| Schedule network analysis                     |                             |       | <b>6.5</b>      |            |            |                 |               |             |             |             |
| Source selection analysis                     |                             |       |                 |            |            |                 |               |             | <b>12.1</b> |             |
| Strategies for opportunities                  |                             |       |                 |            |            |                 |               | <b>11.5</b> |             |             |
| Strategies for overall project risk           |                             |       |                 |            |            |                 |               | <b>11.5</b> |             |             |
| Strategies for threats                        |                             |       |                 |            |            |                 |               | <b>11.5</b> |             |             |
| Test and inspection planning                  |                             |       |                 |            | <b>8.1</b> |                 |               |             |             |             |
| Testing/product evaluations                   |                             |       |                 |            | <b>8.3</b> |                 |               |             |             |             |
| Three-point estimating                        |                             |       | <b>6.4</b>      | 7.2        |            |                 |               |             |             |             |
| To-complete performance index                 |                             |       |                 | <b>7.4</b> |            |                 |               |             |             |             |
| Training                                      |                             |       |                 |            |            | <b>9.4</b>      |               |             |             |             |
| Virtual teams                                 |                             |       |                 |            |            | <b>9.3, 9.4</b> |               |             |             |             |

<sup>A</sup> The boldface entries indicate the section numbers of the processes where a tool or technique is described.

# Categories of Tools and Techniques

---

➤ PM Tools & techniques categorised for 6 project phases are:

## 1. Project selection techniques.

- (a) Cost-benefit analysis.
- (b) Risk and sensitivity analysis.

## 2. Project implementation (execution) planning techniques.

- (a) Work breakdown structure (WBS),
- (b) Project implementation plan, (c) Project responsibility matrix.
- (d) Project management manual(s),

## 3. Project scheduling techniques.

- (a) Line of balance (LOB) (b) Bar charts,
- (c) Network techniques (CPM/PERT),

## 4. Project Monitoring Techniques.

- (a) Progress measurement technique.
- (b) Performance monitoring technique,
- (c) Updating, reviewing & reporting technique.

# Categories of Tools and Techniques

---

## 5. Project cost & productivity techniques.

- (a) Value engineering, (b) Budgetary control,
- (c) Cost/WBS,

## 6. Project communication techniques,

- (a) Computerised information system,
- (b) Control room, and (c) MIS.

**Nine PM techniques suggested by Logan Derrick, an expert at Elite Content Writing Services, a SEM (Search Engine Marketing) Consultant are :**

**SCRUM, Process-based PM, Traditional PM,**  
**Extreme PM, Critical Chain PM, Critical Path PM,**  
**PERT, Rational Unified Process, Waterfall PM.**

# Scrum

---

- **Scrum** : is from Agile Development Framework which has a set project overview, which can be altered or changed by doing continual evaluations of achieved results.
- **Scrum works in sprints & during each sprint, work will be on a particular deliverable / feature, scheduled with task dependencies in mind.**
- **Sprints shouldn't last longer than 2 weeks, & status update meetings held daily & review meeting on completion of each sprint to come up with suggestions for improving the next sprint.**



# Scrum

---

- In this technique Scrum Master leads the discussion, group decides how to remove the obstacles blocking the project.
- This technique primarily used by software development project teams, & teams that work on complex projects requiring multiple iterations throughout the PLC .

# Process-based and Traditional PM Tech

---

- **Process-based PM:** is based on trickle-down process for completing project.
  - For each project task or goal identified, team follows the same principles / objectives the company follows in its mission, vision.
- **Traditional PM:** is the most common technique ideal for small teams with lenient clients who trust judgement of Project Manager, who assigns work, issues instructions, monitors , assesses the project & provides feedback on project outcome.

# Extreme and Critical Chain PM Technique

---

- **Extreme PM:** is used where a project is highly complex with an undetermined approach.
  - When using this technique, it is difficult to set specific goals / milestones, instead, these objectives are decided upon as the project progresses.
- **Critical Chain PM:** is used when budget is the main focus of a project.
  - Project Manager pays close attention to the budget while hiring team, deciding tools to use, & the most cost-effective ways to accomplish each task.
  - This technique helps companies save money while completing projects.

# CPM

---

- **Critical Path PM: is an effective tech. since 1950s. It places a higher emphasis on the amt. of time it takes to complete a project.**
- **By having a range of key deadlines for each task in the process, Project Manager can push the team to complete the project in a shorter timeframe than usual.**
- **It is used to accurately schedule all project activities, the critical path – the shortest route to project completion, and arranging tasks accordingly.**
- **It's also a great way to establish task dependencies.**

# CPM

---

- **CPM can be combined with PERT to create three task completion time estimates:**
  - **Shortest amount of time**
  - **Realistic amount of time**
  - **The longest amount of time**
- **CPM is best suited to more complex projects with a lot of task dependencies.**
- **Just like WBS & Gantt Charts, CPM can be used as tools, not just as project management techniques.**

# **PERT and Rational Unified Process**

---

- **PERT : Program Evaluation & Review Technique** is an effective way to balance the budget of a project while also being aware of how long it is taking to complete the objectives.
  - It is meant for one-time projects that are designed with plenty of room to make changes & adjustment throughout each step.
- **Rational Unified Process** : was established by Rational Software Corporation, a Department of IBM
  - Technique includes concentration on customer feedback & evaluations of their reactions.
  - As these responses are measured, project is adjusted to ensure the final product is up to the client's precise standards.

# **Work Breakdown Structure (WBS)**

---

- **WBS transforms big project activities into chunks of manageable tasks which team members can easily understand & complete.**
- **Starting from the final deliverable, defined by the project, then define the tasks the team will need to complete in order to finalize the project.**
- **Continue dividing the tasks into work packages till it can't be further broken down the lowest-level work packages into smaller chunks of work.**

## **Waterfall PM – one of the oldest PM tech.**

---

- **As waterfall goes from one level to next, under this strategy, one team's phase can't begin until the previous phase is 100% finished.**
- **Activities & tasks will linearly flow through 5 phases:**
  - **Requirements (Get all necessary documentation)**
  - **Design (Use a WBS to create a list of tasks)**
  - **Implementation (Complete tasks)**
  - **Verification (Review the deliverables)**
  - **Maintenance (Maintain and modify if necessary).**
- **Sequences involved are vital to reaching each milestone.**
- **This tech good for projects with distinct phases that require very few iterations throughout the Proj.LC.**
- **Its not fit for projects which at any stage need to modified / re-discuss its scope/ budget .**



# Gnatt Charts

---

- **A visual technique, good for beginners & pros alike.**
- **It's a visual representation of all tasks the team has to complete to wrap up the project, visualized together with time spans.**
- **By this technique team members can see task dependencies, & time required, as well as how its duration will affect the start dates & deadlines**

# Kanban

---

- **Kanban, one of the easiest PM technique for 1st time Project Manager**
- **Philosophy is in creating 3 columns: To-do ; Doing ; Done**
- **Team members can simply shift tasks from one column to another as the tasks get completed. It is successful for simpler projects, or project teams that are prone to multi-tasking.**
- **Visual PM software is available which offers Kanban boards - make a list of tasks, assign them to different team members; when a certain task is complete, move it to the 'Done' column.**

# Innovative Strategy - Blue Ocean

---

- For more than 2 decades competition has been at the heart of corporate strategy.
- One can hardly speak of strategy without using the word competition: competitive strategy, competitive benchmarking, building competitive advantages, and beating the competition.
- Blue Ocean denotes the market space that's not existence today - the unknown market space or market unattained by competition.
- Blue Ocean strategy provides a systematic approach to make the competition irrelevant.

# Innovative Strategy - Blue Ocean Strategy

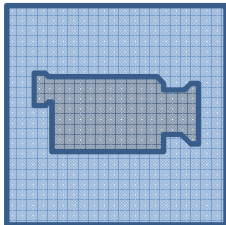
---

- **Prof. Chan Kim & Prof. Renee Mauborgne present a framework in their book "Blue Ocean Strategy - How to Create Uncontested Market Space & Make the Competition Irrelevant" 2005. They coined terms 'red ocean' & 'blue ocean' to describe market universe & proposed BOS**
- **Their study establishes that BOS is particularly needed when "supply exceeds demand in a market," & "this situation is applying to more and more industries today and will be even more prevalent in the future" as explained in an article on Forbes**
- **They suggest companies are better off searching for ways to gain "uncontested market space" over competing with similar companies. Goal isn't to outperform the competition or be the best in the industry.**

# **Rising Imperatives of Creating Blue Oceans**

---

- **Supply is exceeding demand in most industries, global competition is intensifying problems:**
  - **Accelerated commodization of products & services**
  - **Increasing price wars**
  - **Shrinking profit margins**
- **Red oceans becoming bloodier, need to be concerned with creating blue oceans**



**Clip of 7.45 min**

# Blue Ocean Strategy - Aim

---

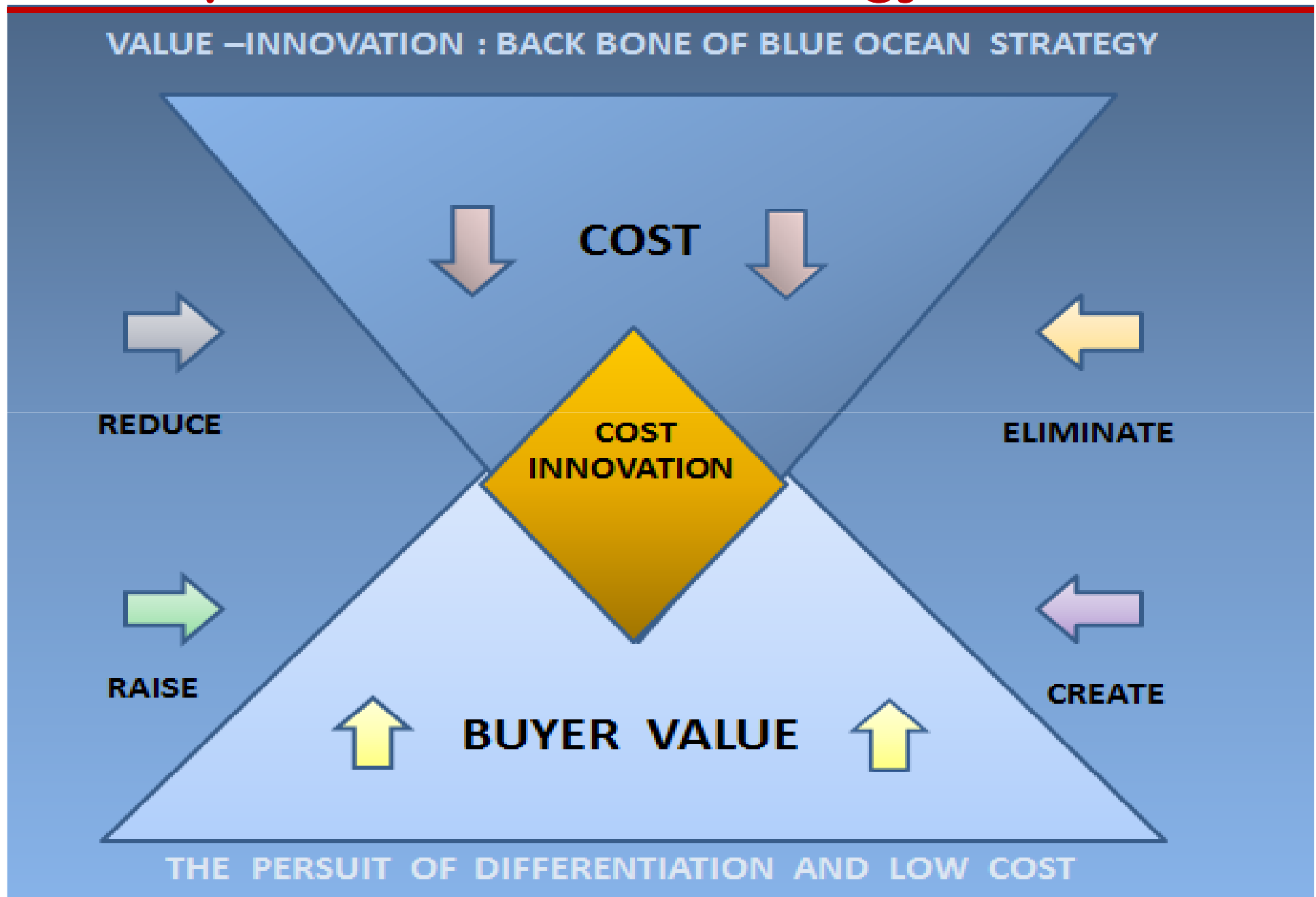
- Aim is to redraw industry boundaries & operate within that new space, making the competition immaterial
- BO Strategy argues that consumers don't have to choose between value & affordability.
- If a company can identify what consumers currently value & then rethink how to provide that value, then differentiation & low cost can both be achieved. This is termed "value innovation."
- This process helps refine ideas & identify opportunities with the most potential, minimizing risk.

# Blue Ocean Strategy - Framework

---

- To discover an elusive Blue Ocean, Professors suggested 4 Actions Framework for businesses to reconstruct buyer value curve.
- Framework poses four key questions:
  - **Raise:** What factors should be raised well above the industry's standard?
  - **Reduce:** What factors were a result of competing against other industries and can be reduced?
  - **Eliminate:** Which factors that the industry has long competed on should be eliminated?
  - **Create:** Which factors should be created that the industry has never offered?

# Concept of Blue Ocean Strategy





# Red Oceans

---

## ➤ In the Red Oceans :-

- Industry boundaries are defined & accepted, and the competitive rules of the game are known.
- Here companies try to outperform their rivals to grab a greater share of existing demand.
- As the market space of red oceans gets crowded, prospects for profits & growth are reduced.
- Products become commodities, and cut throat competition turns the red ocean bloody.
- Red oceans will always matter & will always be a fact of business life.

# Blue Oceans

---

- In contrast, Blue oceans are defined by untapped market space, demand creation, & the opportunity for highly profitable growth.
- Here, competition is irrelevant because the rules of the game are waiting to be set.
- The term "Blue Ocean" is an analogy to describe the wider potential of market space that is vast, deep, & not yet explored.
- Companies need to go beyond competing in established industries. To seize new profit & growth opportunities, they also need to create blue oceans.

# Red Ocean vs. Blue Ocean



Cost Reduction

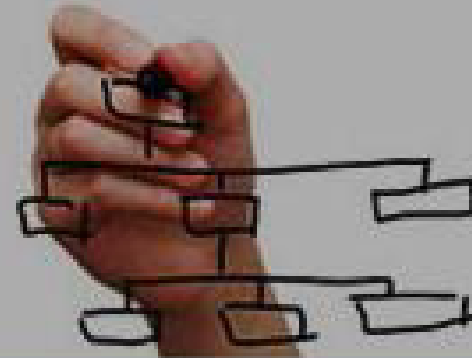
Following Best Practices

Compliance

Efficiency

Brand Management

**“Defend Current Position”  
Perspective**



Value Creation

Skillful Thinking

New Idea Creation

Exploration

Brand Creation

**“Innovate & Pursue new opportunities”  
Perspective**

# **Blue Ocean Strategy - Importance**

---

- **It provides a true alternative & challenge to the traditional normal business strategic thinking.**
- **Creating New Market Space - It is a group of ideals encompassing tools & methodologies to assist firms gain a competitive edge by creating uncontested market area or blue oceans.**
- **The cornerstone of BOS is a conception known as price innovation that's to align its cost structure & its price proposition to its customers.**
- **Value innovation is doable only when a company's utility, value & cost structures are unit properly aligned.**

# Blue Ocean Strategy – in Practice

---

- Kim pointed out how Amazon has shifted from an online retailer to a digital platform that sells practically anything.
- Think of Amazon's initial blue ocean shift in book retailing, that separated it from the pack, with its offering of :
  - the largest selection of books in the world,
  - good prices,
  - automatic confirmation of buyers' orders,
  - its useful selection on 'people who bought this book also bought' &
  - First hand reviews on what readers found useful or not in a book.
- Amazon isn't always successful in creating blue oceans, however, it failed in a few instances - Zappos, eBay & Apple.

# Blue Ocean Strategy – in Practice

---

- "In each of these cases, the companies Amazon went up against, had created blue oceans of their own, & whenever Amazon tried to imitate them, they failed," said Mauborgne.
- "The lesson here is that the best defense is offense, & the best offense ... is to make a blue ocean shift & create your own blue ocean.
- Imitation is not the path to success, especially in the overcrowded industries most companies today confront."

# Blue Ocean Strategy – in Practice

---

- Another company that created a blue ocean shift is 'Home Depot', which made an original value-cost frontier that led to the multibillion-dollar DIY market, according to Kim.
- "When they saw Amazon encroaching upon their space, instead of competing head-on ... they doubled down on offering what Amazon could not – knowledge and advice to complete complex do-it-yourself projects such as renovating your bathroom on your own," said Kim.

**Thanks for  
kind  
Attention**