Applying Project Management Techniques to Low-Volume Manufacturing Operations
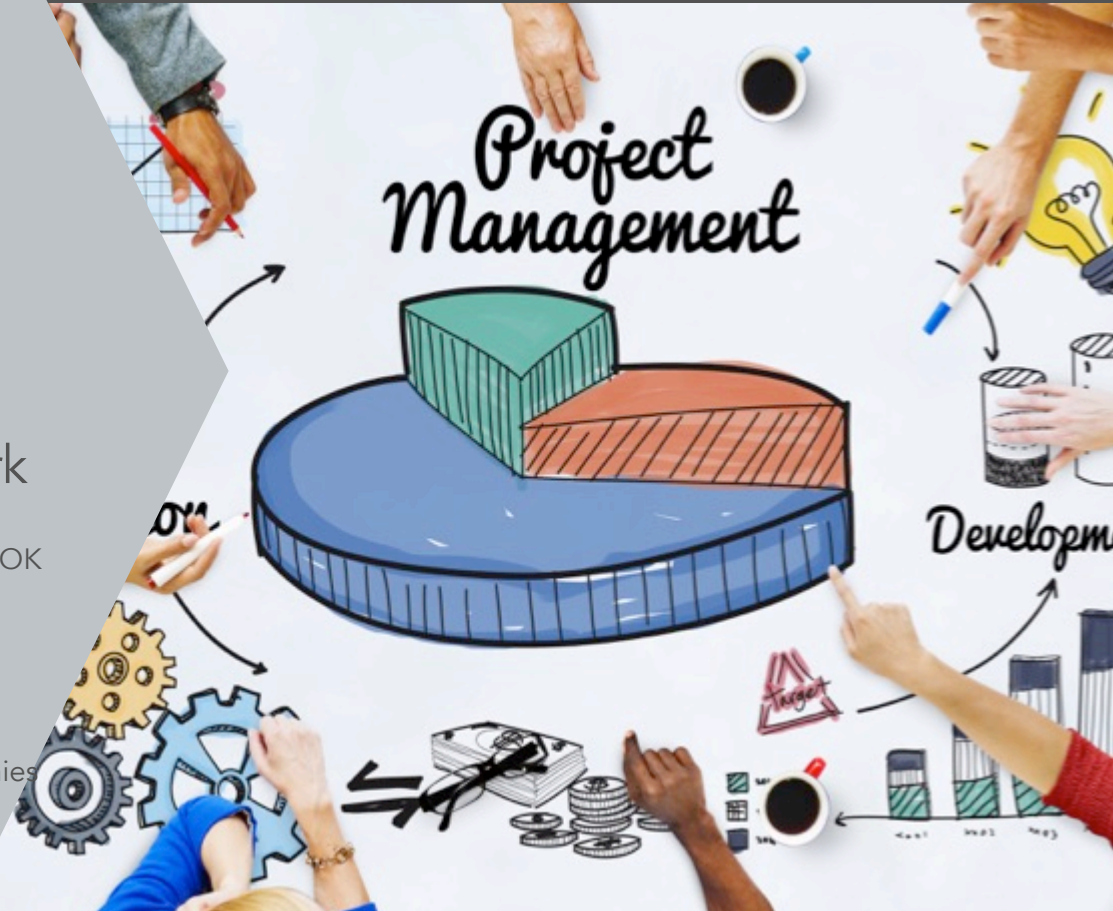
Nicholas J. Holdcraft

Project Management is my Passion

Coaching and Volunteer Work

Review Committee member for the 6th Edition PMBOK
Item exam writer for the CAPM
Annual contributor to the speaker panel of Scrum
Alliance
Learning Objective writer for the RMP exam
Volunteer for the PMI institute 5 x year
Agile leadership coach for numerous global companies

Project Management is my Passion

HQ in Munich (investment capital)

Assembly Facility Wroclaw Poland

Founded 9 years ago

More than 10.000 vehicles on the market

Fully designed and assembled in Europe

Top Speed: 90 kph

Range: 100 km

Charging: 2 hrs

We are about the PEOPLE

250 employees/shift in assembly facility

22M EUR annual turnover

Capital Investment 50M EUR in past 3 years

72% of market share in Europe (# of vehicle)

200% revenue growth in last 2 years

(400% revenue growth in 2017)

No robots…..yet

GOVECS
European Focused Sales Network

GOVECS Wrocław, Poland
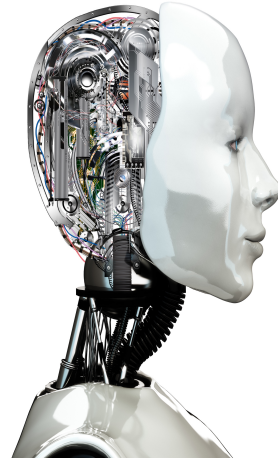
The largest 2-Wheel Electric Assembly Facility in Europe

GOVECS Key Pillars

Technology
Intelligent components
Networked systems
Modularity
Functional integration
Microsystems

People
Human machine Interface
Adaptive technology
Intelligent interactivity
Intuitive operations

Qualification
Training the new generation
Employee qualification
Learning systems
Technician interaction

What is Project Management

Project Management:

Is a structured way of
GETTING WORK DONE EFFICIENTLY

What is Project Management?

The primary challenge is to achieve all of the project goals and objectives while honoring the preconceived constraints. Typical constraints are **scope**, **time**, and **cost**.

The secondary—and more ambitious—challenge is to **optimize** the **allocation** and integrate the inputs necessary to meet pre-defined objectives.

Globally Recognised Associations

Project Management Techniques applied in Manufacturing

IRIS

Iterative Project Management Tools
**Risk** Management Mindset
Integration of Continuous Leadership
Stakeholder Management Techniques

Iterative Project Management Tools

Backlog Pro Tips

- One idea or task per card or sticky not
- It should represent no more than a few days of real work to do.
- Don't organise them until all are on the board
- Put as much information on each card
- Make the visible to all stakeholders
- They should be relatable
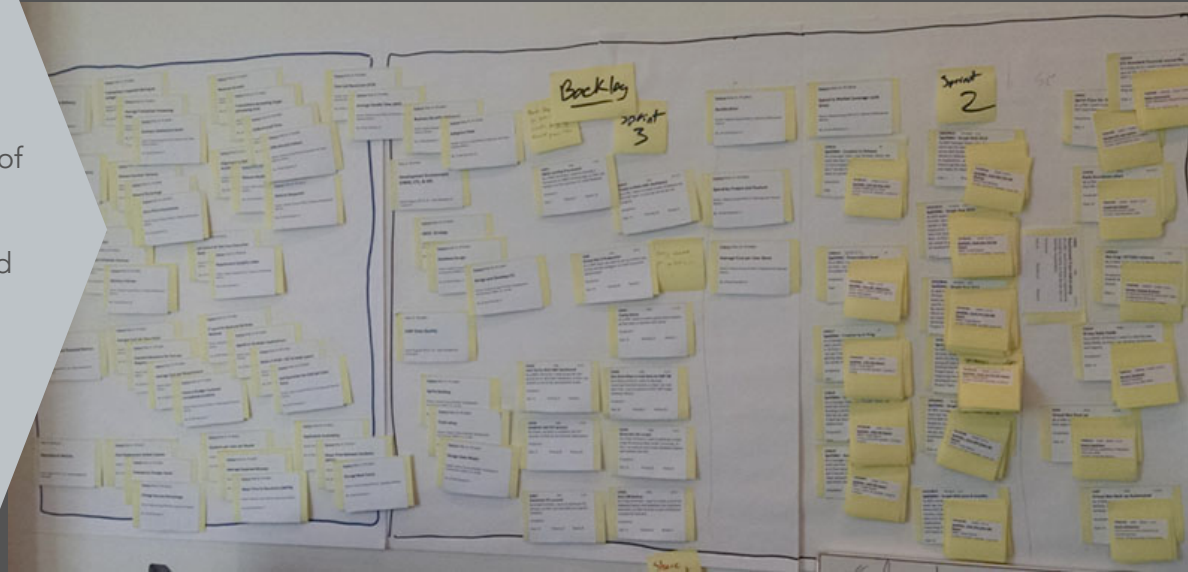
Use Kanban for Flow

Kanban Tips and Tools

- Maintain WIP to be as low as possible
- Quicker quality feedback loops
- Fewer errors due to quick feedback
- Over production and waste is minimised
- Visual way to track and show work / canceled work
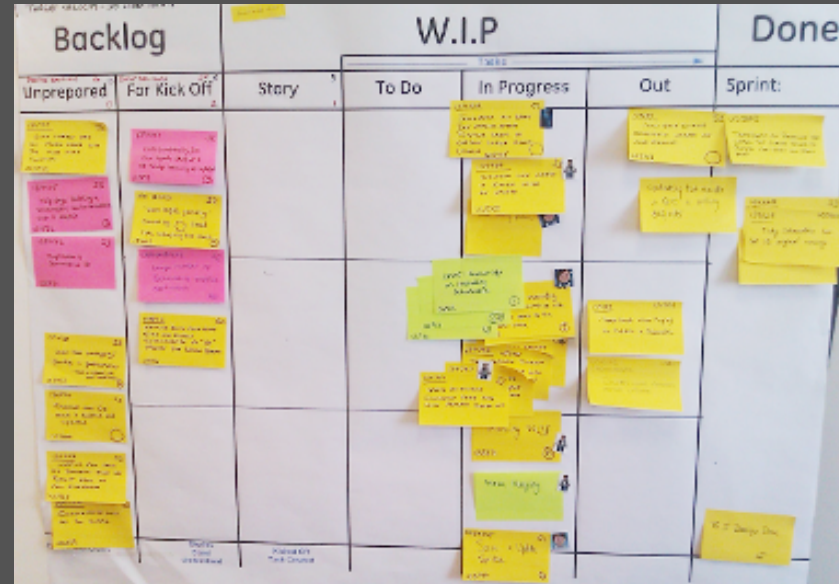
Communicate Frequently

- Speak everyday about what can be done next
- Prototype every idea, before committing
- In person meetings
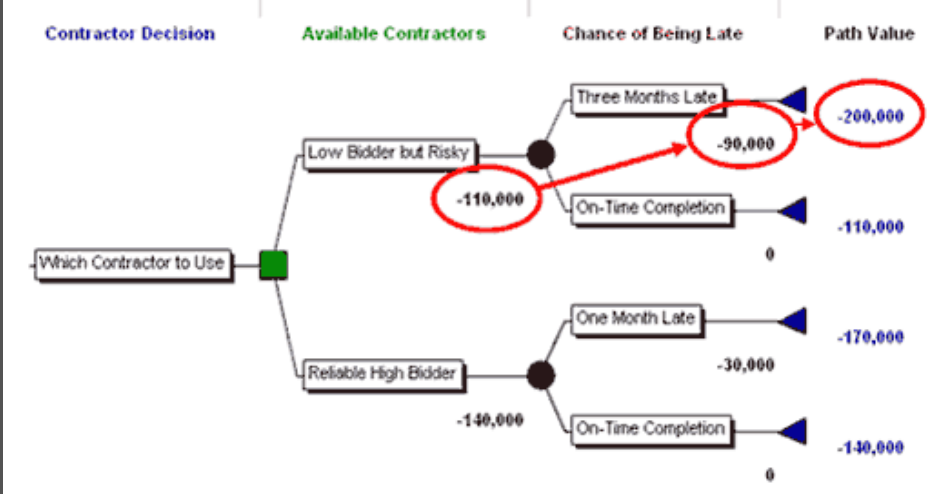- Understand constraints
- Meet in a visible area

Risk Management Mindset

Risk Management Mindset

- 11.4 Perform Quantitative Risk Analysis

Project Risk Management

- 11.1 Plan Risk Management
- 11.2 Identify Risks
- 11.3 Perform Qualitative Analysis
- 11.4 Perform Quantitative Analysis
- 11.5 Plan Risk Responses
- 11.6 Implement Risk Responses
- 11.7 Monitor Risks

Project Risk Management

- 11.1 Plan Risk Management
- 11.2 Identify Risks
- 11.3 Perform Qualitative Risks
- 11.4 Perform Quantitative Risks
- 11.5 Plan Risk Responses
- 11.6 Implement Risk Responses
- 11.7 Monitor Risks

- 11.6 Implement Risk Responses

	$1-100	$101-1000	$1001-5000	$5001-50,000	$50,000-250,000	$250,000-500,000	$500,001-1,000,000	$1,000,001-$5,000,000	Greater than 5M
Once every 10 years or less	2	2	2	2	2	2	2	2	2
Once every 5 to 10 years	12	10	8	6	1	3	1	1	1
Once every 1 to 5 years	20	18	16	2	3	1	1	1	1
Once every 1 to 4 quarters	35	25	15	1	1	1	1	0	1
Once every 1 to 3 months	60	15	10	1	1	0	0	0	0
Once every 1 to 4 weeks	100	10	8	1	0	0	0	0	0
Once every 1 to 7 days	100	11	8	1	0	0	0	0	0
1 to 10 times per day	8	1	3	0	0	0	0	0	0
More than 10 times per day	5	1	2	0	0	0	0	0	0
Total	342	93	72	14	8	7	5	5	5

	#	Name	Relevant	Abs Consequence	Abs. Likelihood	Abs Risk Level	Ctrl Consequence	Ctrl Likelihood	Ctrl Risk Level
1	1	Benefits / ROI not clearly defined	Yes	Catastrophic	Likely	Extreme	Moderate	Moderate	High
2	2	Benefits / ROI not supported with m	Yes	Major	Almost Certain	Extreme	Moderate	Unlikely	Moderate
3	3	Benefits / ROI not approved by Sr M	Yes	Major	Moderate	Extreme	Minor	Moderate	Moderate
4	4	Unclear Ownership / Responsibilitie	Yes	Catastrophic	Almost Certain	Extreme	Moderate	Unlikely	Moderate
5	5	Business Process change not clearl	No	Catastrophic	Not Set	Low	Major	Rare	High
6	6	Business Process change not appro	Yes	Moderate	Almost Certain	Extreme	Moderate	Moderate	High
7	7	Unclear Ownership / Responsibilitie	Yes	Catastrophic	Almost Certain	Extreme	Major	Moderate	Extreme
8	8	Resulting changes in Work Proced.	Yes	Moderate	Moderate	High	Moderate	Rare	Moderate
9	9	Work Procedures and Organisation	Yes	Catastrophic	Moderate	Extreme	Moderate	Moderate	High
10	10	Unclear Ownership / Responsibilitie	Yes	Catastrophic	Rare	High	Moderate	Moderate	High
11	11	Tasks assigned to Business Reps /	No	Major	Likely	Extreme	Moderate	Rare	Moderate
12	12	Arbitrary Business decisions about P	No	Major	Almost Certain	Extreme	Minor	Unlikely	Low
13	13	Supplier / Subcontracting Contracts	No	Catastrophic	Likely	Extreme	Moderate	Likely	High
14	14	Supplier / Subcontracting Contracts	No	Major	Almost Certain	Extreme	Insignificant	Almost Certain	High
15	15	Supplier / Subcontracting Contracts	No	Major	Unlikely	High	Moderate	Rare	Moderate
16	16	Parties involved in Project not all inc	No	Catastrophic	Likely	Extreme	Moderate	Moderate	Moderate
17	17	Functions required in Project not all	No	Moderate	Likely	High	Minor	Likely	High
18	18	Unclear (defined / understood) Role	No	Catastrophic	Likely	Extreme	Minor	Rare	Low
19	19	Critical Positions not timely filled	No	Major	Likely	Extreme	Moderate	Likely	High
20	20	Issues / Conflicts Escalation / Reso	No	Catastrophic	Almost Certain	Extreme	Catastrophic	Rare	High
21	21	Insufficient Buy-in / Commitment of	No	Major	Almost Certain	Extreme	Insignificant	Almost Certain	High
22	22	Project Team not physically co-local	No	Minor	Likely	High	Minor	Unlikely	Low
23	23	Basic Equipment (office space / wo	No	Catastrophic	Moderate	Extreme	Insignificant	Moderate	Low
24	24	Standard Project Management Proc	No	Catastrophic	Moderate	Extreme	Insignificant	Moderate	Low

Risk Register

Risk registers are usually used to house a complete list of risks that a business may face in one place.

On the surface it makes sense to itemise all these various threats but is the big picture really visible to us?

Such systems introduce lots of problems if we aren't aware of them in the first place.

Risk Register Quandaries

- Most risk registers only look at the downside of risk, not the upside from risk taking.

- Risk registers have a tendency to use traffic light tagging to highlight concerns. While this improves report readability, it results in a very limited view of risk.

- When risks are represented numerically, only one number is often shown. Is this the maximum risk or perhaps just the expected loss.

- The correlation or clustering between risk events is generally lost in a risk register.

Risk Management Mindset

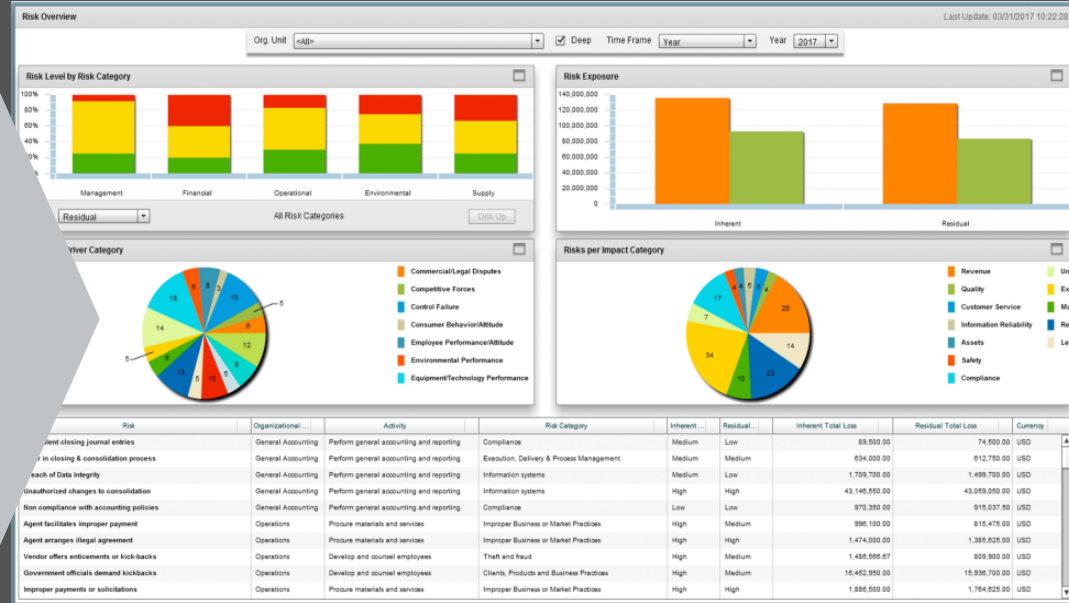## Tolerance and Threshold Explained

Risk is NOT NEGATIVE. It only is when it is outside of your TOLERANCE.
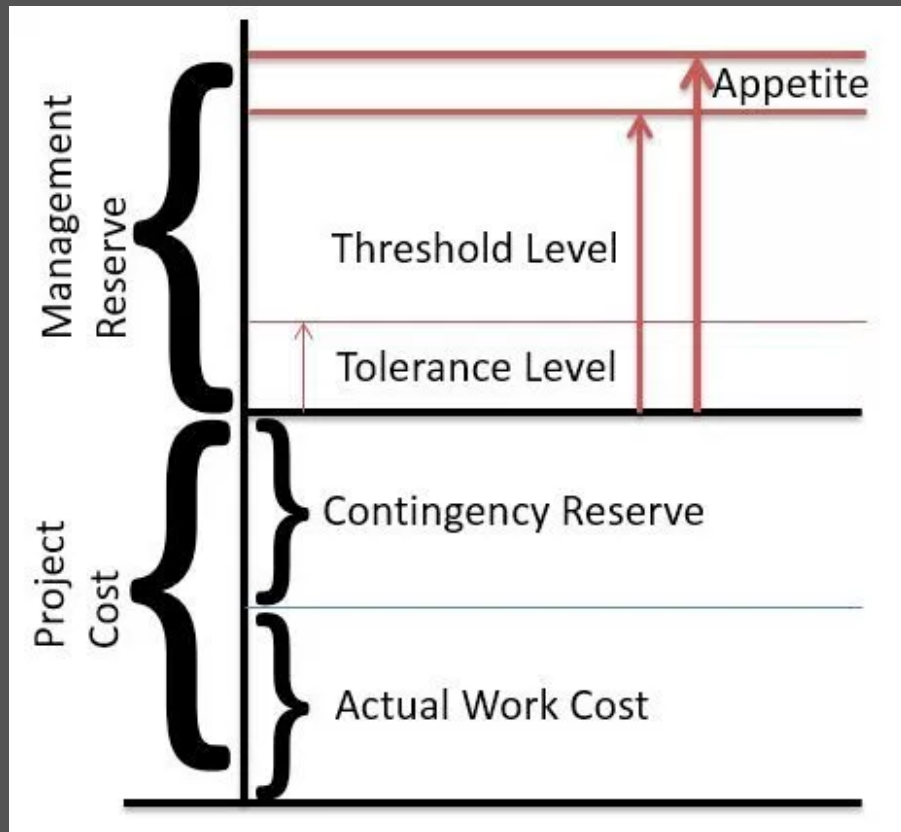
Risk Management Tools

Application to Manufacturing Projects:

Project Risk Management: Includes the process of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project.

Integration of Continuous Leadership

Environment can be in Manufacturing

- Continual feedback loops
- Self-organized 'after-hours' events
- Monthly anonymous employee satisfaction surveys. Publicized results
- Bi-monthly off-site self-sponsored leadership meetings
- Every new employee works on the assembly line for 1 week

Integration Stand Ups

- No longer than 15 min

- Must be visual

- Visual and purposeful eye contact

3 Key Questions to Ask

- Why are we here?

- What are we doing about it today?

- What will we do about it in the future?

- Easily manage open and collaborative goals or OKRs

- All goals are shared with team members. I personally send my results to the site.

- In place at GOVECS for more than 2 years

- Surveys show that employee satisfaction has doubled from both managers and direct reports. Not easy from start.

- Employees can provide feedback to managers in 360 degree reviews
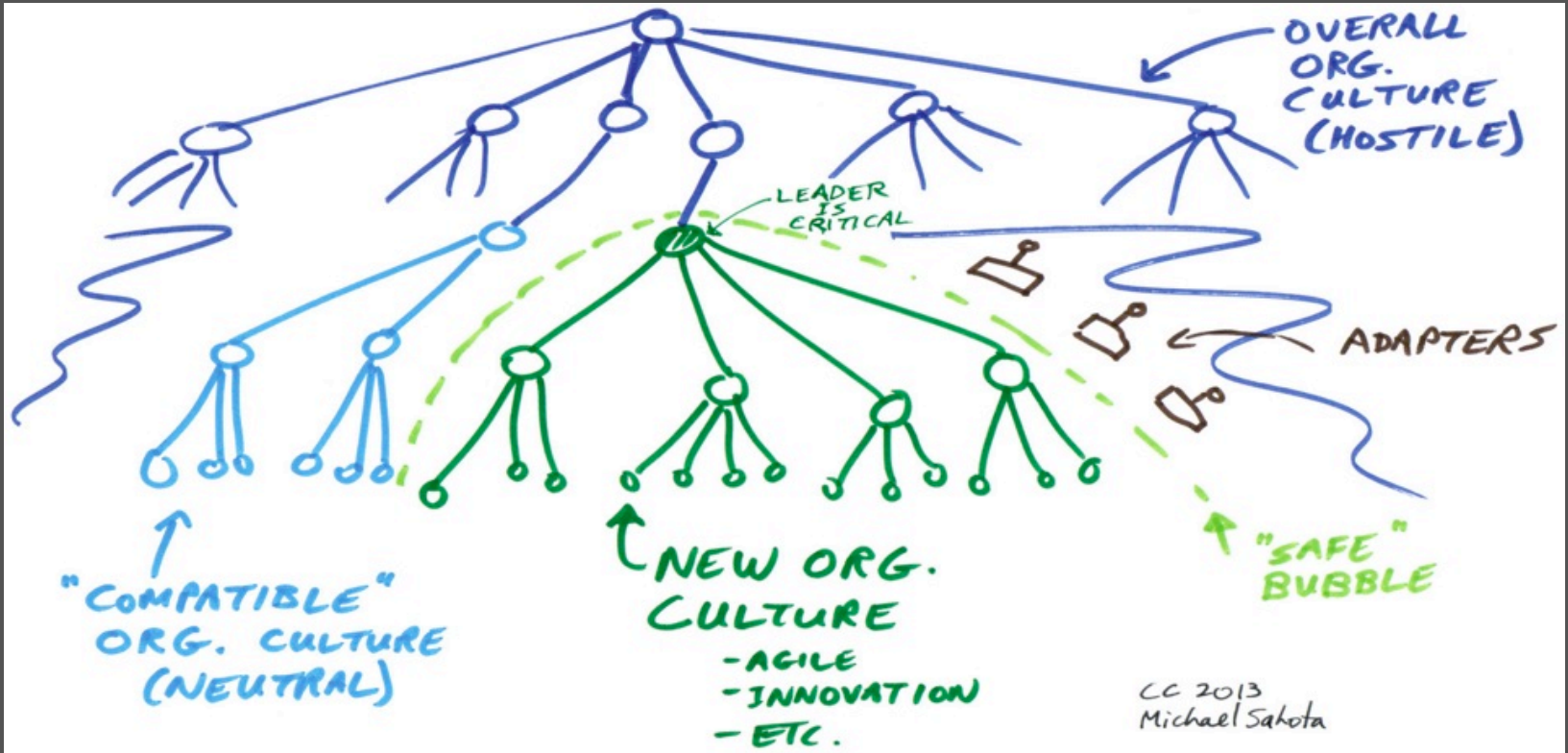
Continuous Performance Feedback
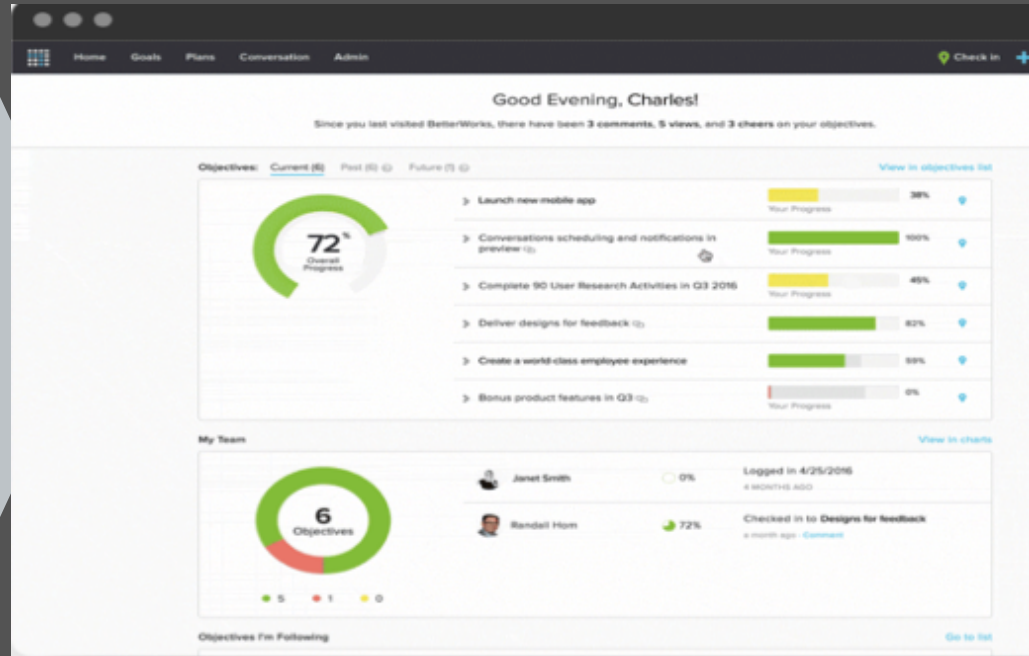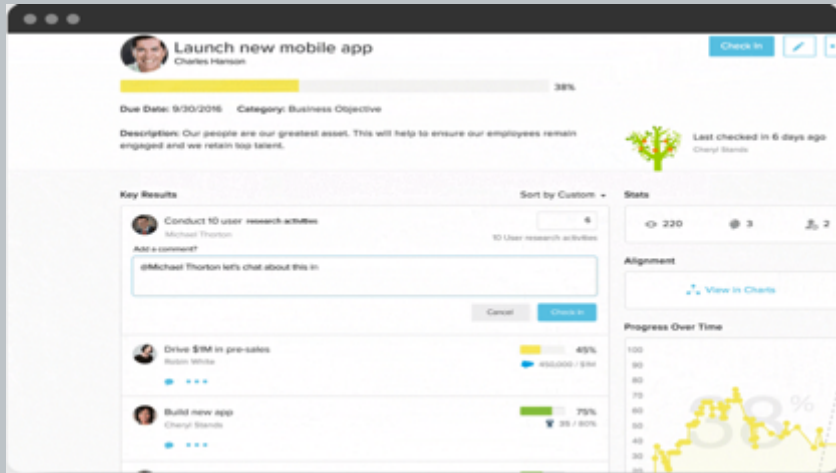
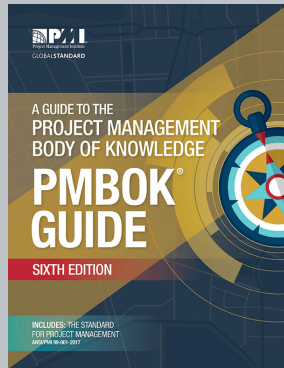NO MORE year end REVIEWS

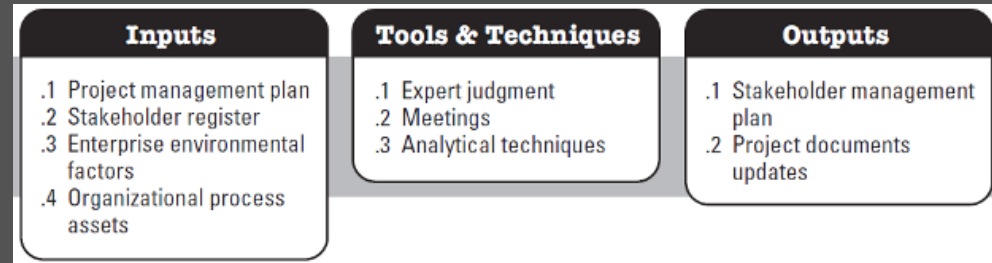Continuous Use of Unfiltered Tools
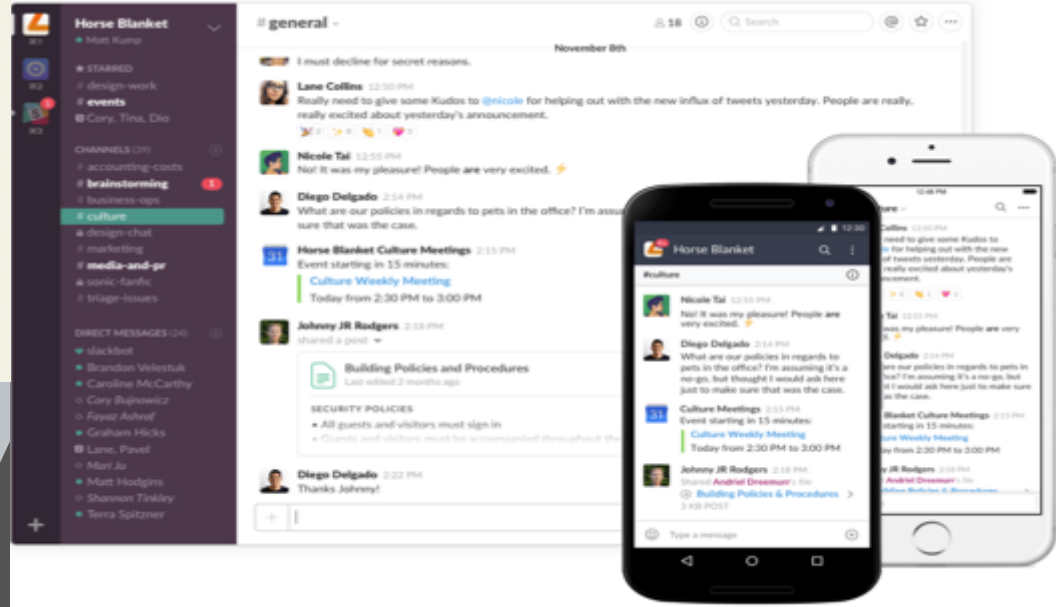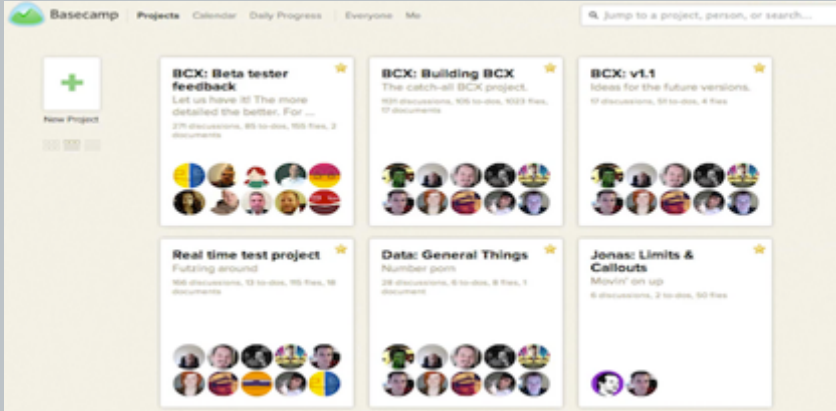
Stakeholder Management Tools

Project Stakeholder Management

- **13.1 Identify Stakeholders**
- 13.2 Plan Stakeholder Engagement
- 13.3 Manage Stakeholder Engagement
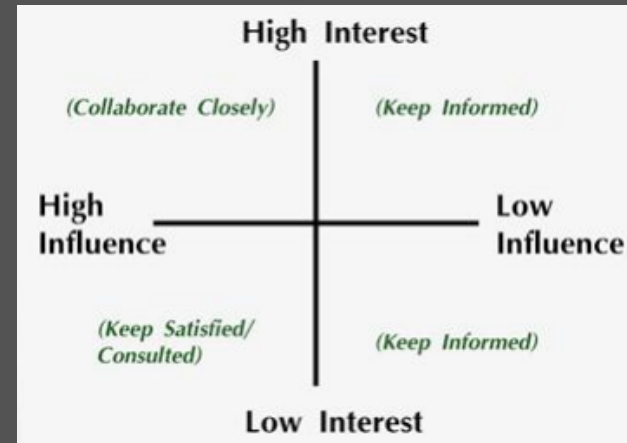- 13.4 Monitor Stakeholder Engagement

Stakeholder Management Tools

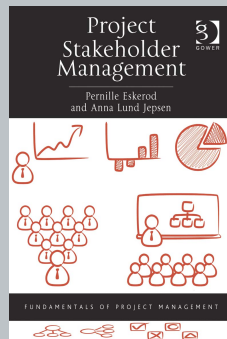| Inputs	Tools & Techniques	Outputs
.1 Project charter .2 Procurement documents .3 Enterprise environmental factors .4 Organizational process assets	.1 Stakeholder analysis .2 Expert judgment .3 Meetings	.1 Stakeholder register

Who's impacted by this?
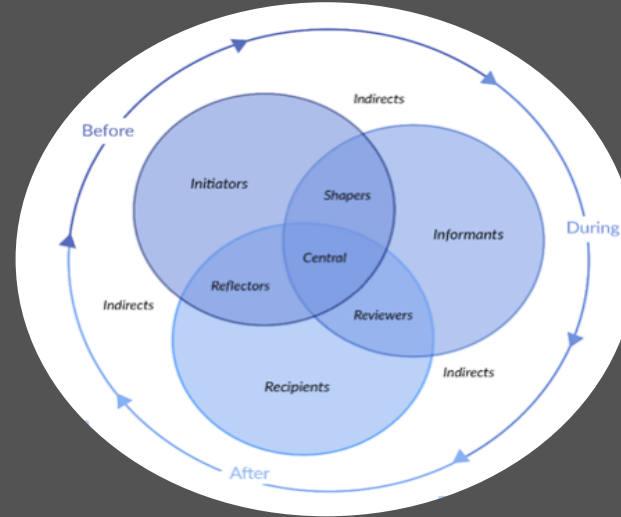
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Inputs	Tools & Techniques	Outputs
.1 Project management plan .2 Stakeholder register .3 Enterprise environmental factors .4 Organizational process assets	.1 Expert judgment .2 Meetings .3 Analytical techniques	.1 Stakeholder management plan .2 Project documents updates

What to do now?

High Interest

(Collaborate Closely)   *(Keep Informed)*

High Influence   **Low Influence**

(Keep Satisfied/ Consulted)   *(Keep Informed)*

Low Interest

Project Stakeholder Management

Pernille Eskerod and Anna Lund Jepsen

FUNDAMENTALS OF PROJECT MANAGEMENT

Stakeholder Management Tools

Project Stakeholder Management

- 13.1 Identify Stakeholders
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- **13.3 Manage Stakeholder Engagement**
- 13.4 Monitor Stakeholder Engagement

Stakeholder Register

Project Name	New Scooter Launch		Project Manager	GOVECS PM1			Project Phase		Initiation		Date	05-May-17
Sr. No.	Name	Designation	Department	Role	Contact	Category	Interest	Influence	Expectations	Comms requirements	Comms frequency	Comments
1	TBD	Director	Technology	Sponsor	You know where…	Internal	●●●	●●●	User friendly and responsive UI across handheld device, tablet or desktop	Video Conference and Email	Weekly	
2	TBD	Vice President	Technology	Project Lead	You know where…	Internal	●●●	○●●	Project to be delivered on time within budget	Email and Telephone	Daily	
3	TBD	Manager	Technology	Product Manager	You know where…	Internal	○●●	○○●	Clear Requirements and timely completion of documentation	Email and Telephone	Daily	
4	TBD	Associate	Technology	PMO	You know where…	Internal	○●●	○○●	Project to be delivered on time within budget Timely approvals to be obtained	Email and Telephone	Daily	
5	TBD	Vice President	Technology	Dev Manager	You know where…	Internal	○●●	○●●	Develop responsive UI	Email and Telephone	Weekly	
6	TBD	Vice President	Technology	QA Manager	You know where…	Internal	○●●	○●●	UI is responsive No quality issues Branding is maintained	Email and Telephone	Weekly	
7	TBD	Manager	Technology	Infrastructure Team Lead	You know where…	Internal	○●●	○○●	Changes should not affect the uptime of the system No memory spikes	Email and Telephone	Weekly	

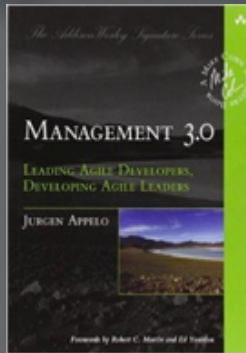| ●●●	High	○●●	Medium	○○●	Low

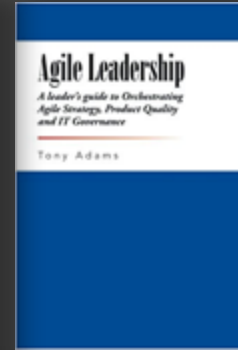# Stakeholder Management Tools

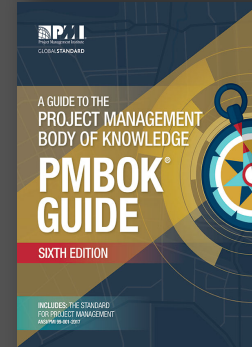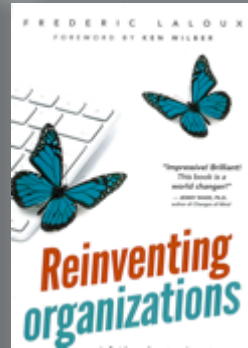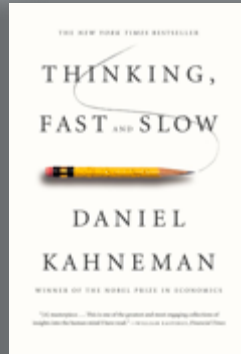## Project Stakeholder Management

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- 13.2 Plan Stakeholder Engagement
- 13.3 Manage Stakeholder Engagement
- 13.4 Monitor Stakeholder Engagement

Ask these key questions

1. Have any stakeholders changed positions?
2. Is meeting attendance where it should be?
3. Are status reports being read and understood?
4. Have the output artifacts changed?
5. What is the communication channel to key stakeholders?
6. Any recent changes to the communications plan?

BOOKS

Recommended Readings

QUESTIONS