



Project Value

The System Dynamics of Project Management

Based on work done by W.J. Ledet Jr., as published on
www.practicefields.com

Projekt Management Fakten



- 35% aller Projekten werden gar nicht fertiggestellt Oracle Inc
- 84% alle Projekte werden nicht innerhalb der vorgegebenen Zeit- und Budgetrahmen fertiggestellt Standish Group
- Obwohl
 - 1 502 Projektmanagement Kurse angeboten werden www.seminarmarkt.de (22/11/02)
 - 520 Traininganbieter sich mit der Thema beschäftigen www.seminarmarkt.de (22/11/02)
 - 2 000 000 Kopien von MS Project installiert sind Microsoft (Stand: Project 98)

Cobb's Paradox



“We know why projects fail,
we know how to prevent their failure
– so why do they still fail?”

Martin Cobb
Treasury Board of Canada Secretariat

These



- Das Projektmanagement Prozess ist ein System
- Dieses System ist komplex
- Dieses System ist dynamisch

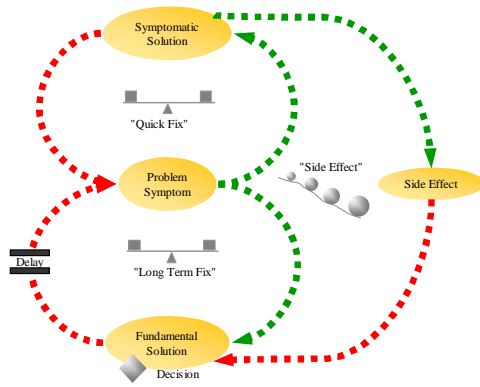
- Projektmanagement unterliegt die Regeln des System Dynamics

System Dynamics



- Wissenschaftliches Disziplin
- Entwickelt Ende der 50er von Prof Jay Forrester, an der MIT (SEHA wg. Artikel: Mass Institute of Tech)
- Analyse, Modellierung und Simulation von komplexen Systeme und deren dynamischen Zusammenhänge
- Überall verwendbar
- Intellektuell anspruchsvoll
- (Nur) Bedingt nachvollziehbar für Laie

System Dynamics Example



Legend

Cause or Effect

Decision Point

Delay

A and B move in same direction

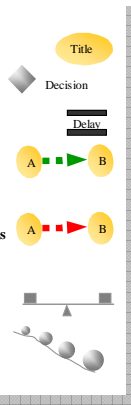
An Increase in A leads to Increase in B

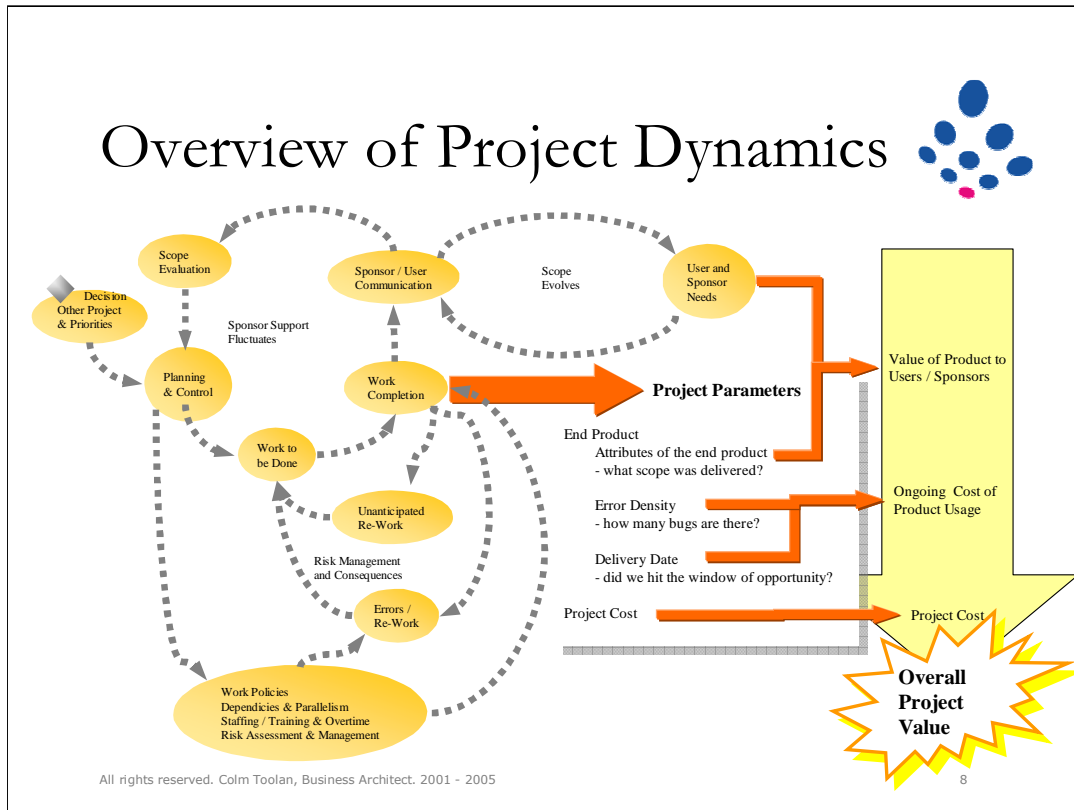
A and B move in opposite directions

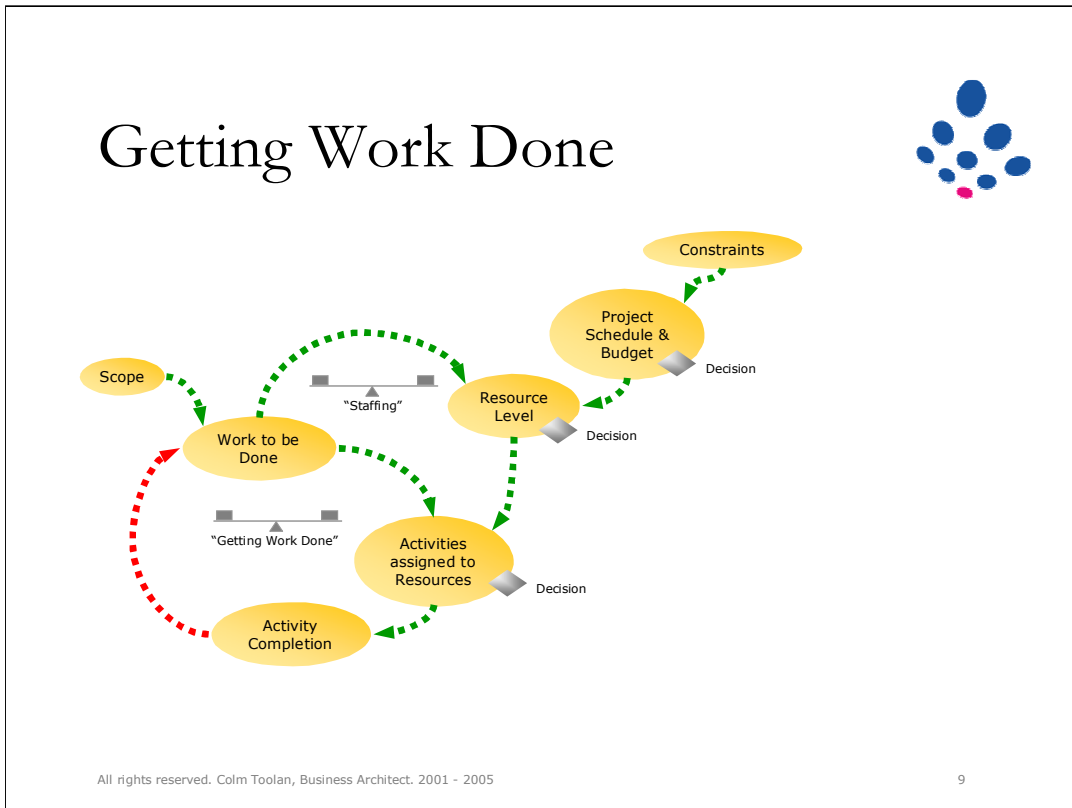
An Increase in A leads to Decrease in B and vice versa

Balancing Loop

Reinforcing Loop (Snowball effect)







The most basic dynamic in the simulation is the process of getting work done.

The **scope** of the project leads to a list of **work to be done**.

This work takes the form of **activities assigned to resources**.

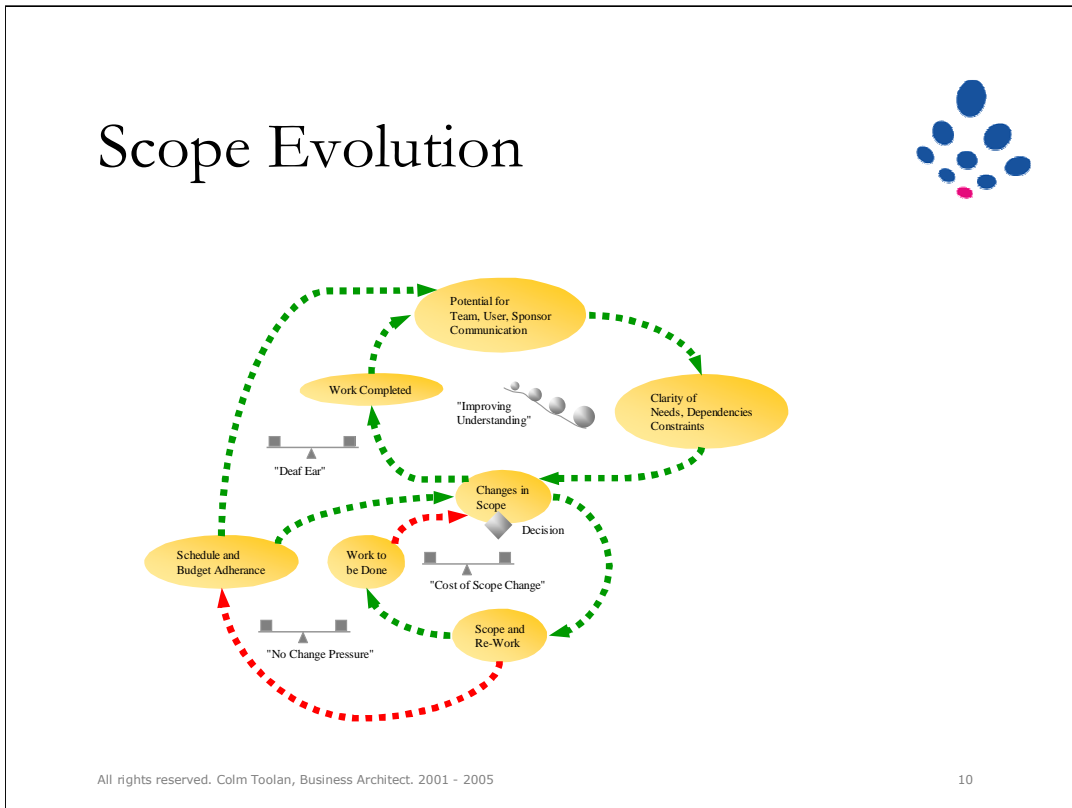
The level and type resources available for the project are determined by

- 1) the overall size of the **work to be done**
- 2) the **project schedule and budget** and
- 3) any organization **constraints** (like headcount).

The resources start working on the activities thus increasing **activity completion**.

As they do this, the amount of **work to be done** diminishes. This is a balancing or goal-seeking feedback loop where the goal is to drive the **work to be done** to zero (i.e., to complete all of the activities in the scope).

The outer feedback loop is also a balancing loop. It represents the process by which the project manager balances the team size with overall size of the project, the scheduled completion and the budget.



Scope change is often cited as the greatest problem in project performance. In our simulation, we deal with scope endogenously; the actions of the team determine when scope is discovered and what they should do about it.

"Improving Understanding"

As the project unfolds and work is completed, the ability of the team to communicate in a meaningful way with teammates, users and the sponsor grows. For example, when the blueprint of a building is complete or all of the screens on a computer system are built, it is much easier to have a meaningful conversation about user, team and/or sponsor requirements. When the team takes action to harvest this newly created **potential for team, user and sponsor communication** the **clarity of needs, dependencies, and constraints** of the project increases. All these new learnings are potential **changes in scope** that the team must evaluate. If they decide to incorporate the new ideas and they complete the new work, they are create more **potential for team, user and sponsor communication**. Of course not all ideas are good ideas. The teams will have to make trade-offs between conflicting ideas and they will have to manage bad ideas to keep them out of the scope. This reinforcing loop encourages the team to be receptive of scope change but at the cost of additional **work to be done** coming from increased **scope and rework** due to the new requirement.

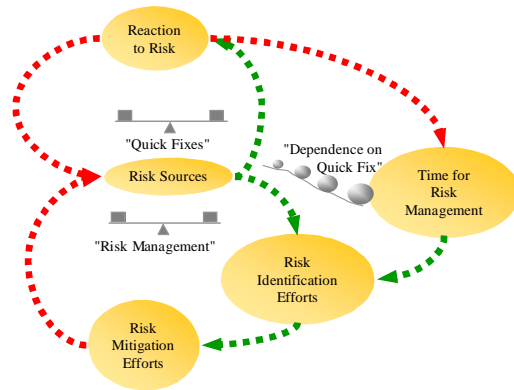
"No Change Pressure"

Eventually someone on the project will either explicitly or implicitly freeze the scope after which there will be a lot of reluctance to change. This dynamic is easy to see. The more work that comes from **changes in scope** the lower the **schedule and budget adherence** becomes. When cost and schedule are too far off of the initial projections the project manager or sponsor will step in a say something like: "We have got to stop redesigning and deliver what we have got. We can always improve it after it is installed." Changes will not be accepted even if relevant and valuable new ideas are being thought up and discovered in the field.

"Don't Listen to Ideas for Change"

If the team does not explicitly freeze scope, they can implicitly freeze it by simply turning a deaf ear to new ideas. When time pressure is high there simply is not time for **team coordination, sponsor communication or user interaction**. The team does hear any new ideas so there are no new ideas to incorporate.

Poor Risk Management



All rights reserved. Colm Toolan, Business Architect. 2001 - 2005

11

For purposes of our simulation we have divided risks by their source and type.

Scope risks are covered in the scope area. Risks from errors and poor team performance are handled in the rework and quality area.

That leaves one type of risk unaccounted for – the risk of an activity failing to produce its intended deliverable. The use of a new material or design in construction projects is a good example. The new material and design may have worked fine in lab tests and computer simulations but when subjected to real world conditions they simply do not perform as expected. Some work must be done to fix the problem when it crops up.

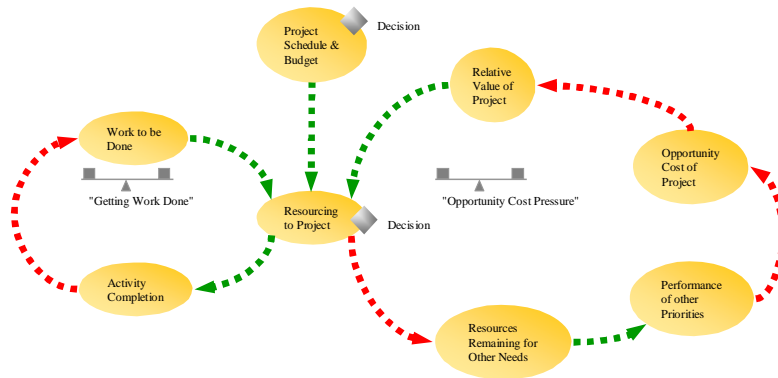
Many organizations find that they get very good at reacting to this type of risk and they develop a culture of problem solving their way out of risks.

This is the "dependence on the quick fix" loop in the diagram and it is self-reinforcing.

The more dependent your organization becomes on the quick fix (**reaction to risk**), the less time you will have to deal with the fundamental solutions (**time for risk mgmt** and consequently **risk identification efforts and risk mitigation efforts**), causing additional problems which require more quick fixes (**reaction to risk**).

Organizations with a reactive culture spend a lot of the project time on problem solving and don't believe they have time for true risk management. Risk management (the lower risk loop) gets at the root of the problem which is understanding the **risk sources** and eliminating or minimizing the likelihood or consequence of risky activities.

Balancing Projects and Other Organizational Needs



All rights reserved. Colm Toolan, Business Architect. 2001 - 2005

12

A problem that comes up over and over again in most project environments is the lack of skilled, qualified people to do the work.

While multiple project dynamics are not included in our simulation, we have tried to capture this real pressure that is felt in most organizations.

If total resources available are limited, as **resourcing to project** grows, resources **remaining for other needs** will go down and so will the **performance of other priorities** (e.g., daily operations and or other project work).

Consequently, the **relative value of the project** to other projects decreases.

We capture the cost of this in our simulation by charging the team for the **opportunity cost of the project**. Paying for the opportunity cost forces the participants in the simulation to self-impose resource limitations that would normally be done for them in a multiple project environment.



COLM TOOLAN
BUSINESS ARCHITECT

Isarweg 35
24146 Kiel

T: +49 431 7859 737

M: +49 171 6450 998

E: colm(full stop)toolan(funny symbol)toolan(full stop)de

W: www.toolan.de