

Process Improvement

ADePT - an overview

Late, over-budget and not meeting the original objectives, many complex projects suffer because the team is focused on the deliverable and not the process involved in creating the end result. In an increasingly competitive marketplace, speed-to-market, quality and innovation are the prerequisites for sustained success and profitability.

This paper describes a unique approach to analysing and improving business and project processes. The key is to identify the complex interfaces between activities, then streamline their management. This approach can be applied within an individual company or a multi-disciplinary team, which wants dramatic improvements in speed to market and predictability of cost and time.

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To improve the project, first improve the process

For many businesses, the following scenario will be painfully familiar:

"It all seemed so straightforward: conceive, design and build an innovative, new product. But during development, problems quickly multiplied: design specifications changed; some activities had to be aborted while others were repeated; information from suppliers was late, inadequate or non-existent; work quality was sub-standard; cost forecasts soared while potential revenues dropped; and the overall development programme had to be repeatedly extended. Things had gone too far to stop altogether, so the project's aims were downgraded. The eventual end result was late, less exciting and much more expensive."

How many times have such scenarios been repeated? The repercussions can be enormous:

- companies may have to write off vast sums of money expended on ineffective development efforts
- legal disputes about who was responsible can drag on for years
- parallel - even potentially more successful - projects may be denied shares of limited resources
- products or services are late to market (if they make it all!), have fewer features than intended, and cost more to deliver

And the pain of lost market share, jobs and profits can be shared across the whole supply chain. Why does this happen? It could arise because team members focus on functional or task-based improvements; while the project deliverable - i.e.: the end result - may initially be specified to a high level of detail, often the team responsible for its creation will not have an accurate picture of just how complex the process of delivery is going to be.

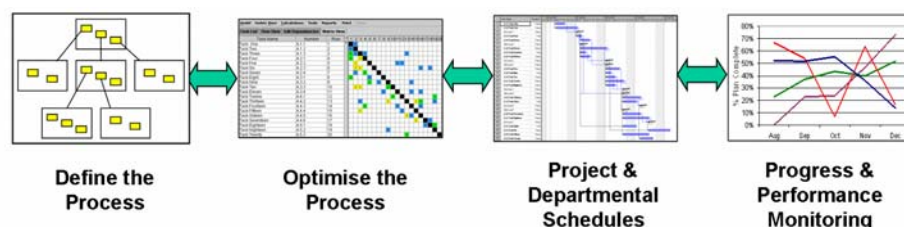
Optimisation of processes, rather than functions, will deliver the most significant improvements in business performance. Once processes have been effectively captured and analysed, wasteful activities can be identified and removed; productive activities can be refined, honed and integrated; and through repeated implementation, significant process improvements can be achieved.

Developing a new product, asset or service is frequently a complex process, involving many hundreds, even many thousands, of activities. And the information flows - or interfaces - that interlink these activities can often number tens of thousands. The scale and complexity of the process is then compounded by the inevitable rework, feedback and iteration inherent in any development process. This is often overlooked when planning. Traditional project planning and scheduling tools are unable to either represent or solve these iterative problems. ADePT (the Analytical Design Planning Technique), however, can¹.

¹ ADePT is a registered trademark of Adept Management Ltd

ADePT

The Analytical Design Planning Technique (ADePT) is an innovative and unique approach to optimising business and project processes. By capturing and streamlining the interfaces between activities in a process, ADePT enables a team to minimise inefficiency by maximising co-ordination based on flows of information.



Many costly and time-consuming problems in any project can be related back to the original development process. Development is almost always an iterative, multi-departmental, multi-disciplinary process - sometimes made even more complex by extending the process across company or geographic boundaries. Ignoring this complexity is neither realistic nor prudent. When many different professionals are working in parallel on different facets of the same project, their inputs need to be effectively co-ordinated and perhaps adjusted when new information comes to light.

“The exchange of information is the lifeblood of product development... Such flows of information allow for experimentation and innovation, and for that reason, many companies encourage feedback and iteration... But excessive iteration can have drawbacks. A continual back-and-forth of work inevitably consumes time and resources. And many of the iterations may turn out to be only marginally beneficial or even wasteful. ... The lesson is clear. Iteration must be carefully planned and managed. Good iteration should be encouraged and bad iteration eliminated.”²

ADePT identifies where iteration is likely to be present within a process and provides methodologies for controlling, reducing or eliminating it depending on the needs of the overall project. In addition to its primary purpose as a planning and decision-making system tool, ADePT is also a risk identification and change management tool. By flagging key dates to team members, the technique prompts the timely production of critical information, giving the team a greater understanding of the process and encouraging inter-departmental collaboration.

ADePT is supported by a software application to implement the approach on large complex problems, enabling project and business teams, and particularly planners and managers, to define, re-engineer, plan and monitor projects efficiently and effectively, from the earliest concepts right through to completion. It fully supports integrated working, virtual team, ‘partnering’ and other collaborative approaches to project delivery:

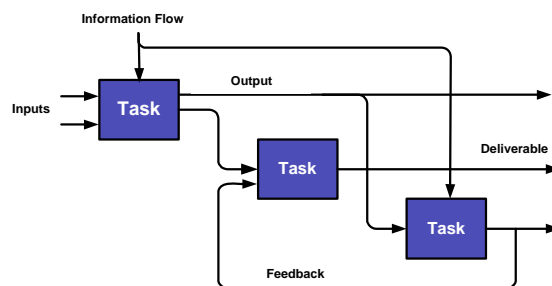
- reduces levels of aborted work
- reduces the risk of cost or programme over-runs
- cuts defects
- lowers project costs, and
- speeds up project delivery

² Steven D Eppinger, ‘Innovation at the speed of information’, *Harvard Business Review*, January 2001

How does ADePT work?

1. Understand the process - produce the process model

The first step is to produce a robust model of the process under consideration. Each component of the process needs to be captured and compiled. The models can be uniquely developed or (more usually) based on a general model, modified and tailored to the specific need of the application and the project team's standard notation. ADePT assembles a model of the process making all participants more aware of the information flows and dependencies between different disciplines.



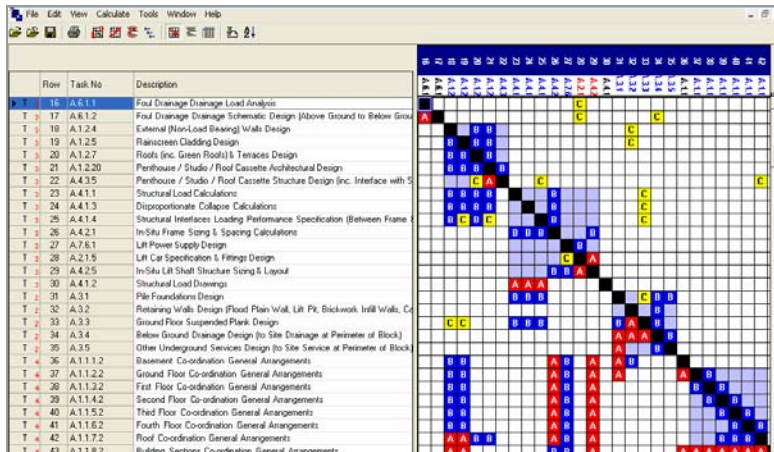
2. Refine the process - prioritise the interfaces

The activities represented in the process model are used to drive a Work Breakdown Structure. This lists the activities in a hierarchical structure, defines the activities' dependencies, and gives their dependencies a priority rating - critical to the calculation of the optimum sequence of tasks. Once complete, the sequence of activities is reorganised to minimise the amount of iteration within the process.

Row	Task No	Description	Responsibility
1	84	A.3 CIVIL ENGINEERING DESIGN	Civil Engineer
2	85	A.3.1 Pile Foundations Design	Civil Engineer
3	86	A.3.2 Retaining Walls Design (Flood Plan Wall, Lift Pit, Blockwork, Infill Walls, Car Park Walls)	Civil Engineer
4	87	A.3.3 Ground Floor Suspended Floor Design	Civil Engineer
5	88	A.3.4 Below Ground Drainage Design (to Site Drainage at Perimeter of Block)	Civil Engineer
6	89	A.3.5 Other Underground Services Design (to Site Service at Perimeter of Block)	Civil Engineer
7	90	A.4 STRUCTURAL ENGINEERING DESIGN	Structural Engineer
8	91	A.4.1 Structural Load Analysis	Structural Engineer
9	92	A.4.1.1 Structural Load Calculations	Structural Engineer
10	93	A.4.1.2 Structural Load Drawings	Structural Engineer
11	94	A.4.1.3 Disproportionate Collapse Calculations	Structural Engineer
12	95	A.4.1.4 Structural Interfaces Loading Performance Specification (Between Frame & Balconies, Bay Windows etc.)	Structural Engineer
13	96	A.4.2 In-Situ Frame / Precast Floor Design	Structural Engineer
14	97	A.4.2.1 In-Situ Frame Sizing & Spacing Calculations	Structural Engineer
15	98	A.4.2.2 In-Situ Frame Layouts & Sections (inc. Party Walls)	Structural Engineer
Proc Task			
		Proc Name	Note Class
	A.1.1.2.1	Ground Floor Planning General Arrangements	A
	A.3.2	Retaining Walls Design (Flood Plan Wall, Lift Pit, Blockwork, Infill Walls, Car Park Walls)	C
	A.1.2.4	External (Non-Load Bearing) Walls Design	C
	A.1.2.5	Rainscreen Cladding Design	C
	A.1.2.6	Internal Partitions Design	C
	A.3.1	Pile Foundations Design	B
	A.5.7.3	Rainwater Pipework Layout Design	C
	A.6.1.3	Foul Drainage Drainage Layout Design (Above Ground to Below Ground System at Ground Floor Slab)	C
	A.4.1.4	Structural Interfaces Loading Performance Specification (Between Frame & Balconies, Bay Windows etc.)	B

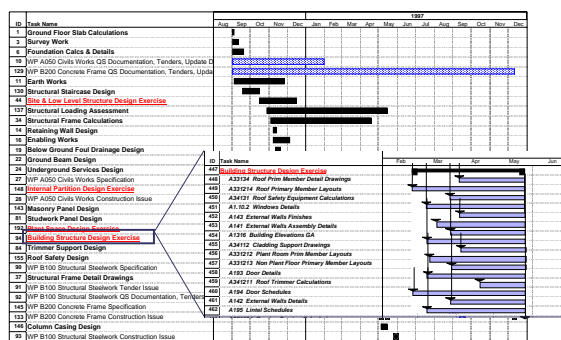
3. Optimise the process - streamline the interfaces and activities

The activities and their dependencies are represented in the project's dependency structure matrix. Tasks are listed as both row and column headings, forming a matrix. Each row displays all the information inputs required to complete the task; each column displays all the information outputs to be provided for other tasks. The matrix highlights which information exchanges involve iteration and which do not. Some iterative loops could be eliminated, others may be minimised, so that the process is as efficient as possible.



4. Develop the programme - integrate external constraints

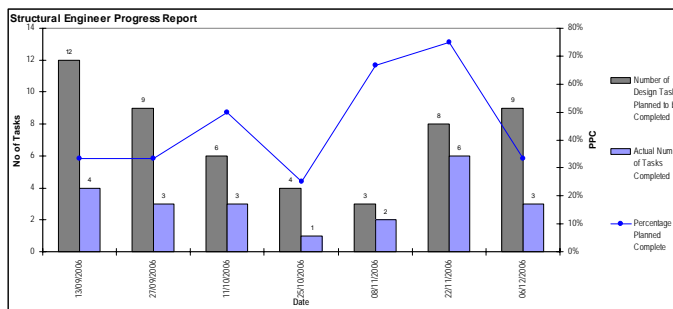
The optimised matrix is then delivered as a programme or delivery schedule by linking ADePT to a project programming software application such as MS Project, Primavera or PowerProject. This programme can then be reviewed and integrated with the procurement or other related projects. If changes are needed, they can be simulated with ADePT and a revised, integrated project programme produced, highlighting critical decision points and potential risks.



5. Monitor the project process - manage the inevitable change

ADePT can then be used throughout the project to monitor the project process. Reports schedule tasks due for completion (and due to be started) in a defined 'look-ahead' period and the team members report progress in each period. The programme is updated at the end of each period allowing team members to examine the impact of changes (e.g.: alterations to the specification, or late completion of activities) and hence make informed, shared and auditable decisions on the most effective way forward. Trends in progress can easily be identified, making significant barriers or blockages in the project process transparent so that remedial action can be taken.

Task Description	Responsibility	Start	End	Status	Comments / Reasons for Delay / Issues to be Resolved
Landscape Planting Schedule	Landscape Architect	17/01/2007	15/01/2007	Not yet due to be started	
Landscape Production Information	Landscape Architect	17/01/2007	25/01/2007	Not yet due to be started	
ACOUSTIC & FIRE DESIGN		14/09/2006	27/09/2006	Undersway, Ongoing	
FIRE DESIGN		14/09/2006	15/09/2006	Undersway, Ongoing	
Preliminary Fire Strategy Report	Architect	14/09/2006	16/09/2006	Already Complete	
Preliminary Fire Strategy Plans	Architect	14/09/2006	21/09/2006	Already Complete	
Update Preliminary Fire Strategy & Drawings	Architect	22/09/2006	23/09/2006	Already Complete	
Ground Floor Fire Compartmentation 1:100	Architect	23/09/2006	23/09/2006	Already Complete	
First Floor Fire Compartmentation 1:100	Architect	23/09/2006	23/09/2006	Already Complete	
Second Floor Fire Compartmentation 1:100	Architect	23/09/2006	23/09/2006	Already Complete	
Building Reg - L2 Compliance Strategy	Architect	04/09/2006	04/09/2006	Not yet due to be started	
Design Review Workshop with Sub-Contractors - Render & Brickwork	Architect	05/09/2006	05/09/2006	Not yet due to be started	
Design Review Workshop with Sub-Contractors - Plant Screens	Architect	06/09/2006	06/09/2006	Not yet due to be started	
Surface Water Production Information	Civil Engineer	11/09/2006	13/09/2006	Not yet due to be started	
ACOUSTICS DESIGN		14/09/2006	27/09/2006	Undersway, Ongoing	
Acoustic Strategy Report	Architect	14/09/2006	17/09/2006	Already Complete	
Ground Floor Acoustic 1:100	Architect	14/09/2006	16/09/2006	Already Complete	
First Floor Acoustic 1:100	Architect	14/09/2006	18/09/2006	Already Complete	
Second Floor Acoustic 1:100	Architect	21/09/2006	21/09/2006	Already Complete	
Acoustic Preliminary Report and Drawings	Architect	21/09/2006	23/09/2006	Already Complete	
Hidden Elements - for Thermal Modelling	Architect	07/09/2006	07/09/2006	Not yet due to be started	
Reverberation Calculations	Architect	18/09/2006	20/09/2006	Not yet due to be started	
Acoustic Final Report and Drawings	Architect	21/09/2006	27/09/2006	Not yet due to be started	
INTERNAL PARTITIONS & DOORS DESIGN		14/09/2006	20/10/2006	Undersway, Ongoing	
INTERNAL PARTITIONS DETAILED DESIGN		14/09/2006	14/10/2006	Undersway, Ongoing	
Internal Partion Types	Architect	14/09/2006	17/09/2006	Already Complete	
Ground Floor 1:50 Internal Partion Layouts	Architect	10/11/2006	16/11/2006	Not yet due to be started	
First Floor 1:50 Internal Partion Layouts	Architect	17/11/2006	23/11/2006	Not yet due to be started	
Second Floor 1:50 Internal Partion Layouts	Architect	24/11/2006	30/11/2006	Not yet due to be started	



Potential applications

ADePT can be used in many different industries and scenarios. The following are just a couple of examples.

Product/service development

ADePT was proven and used to demonstrate potential improvements in the development process for new engine lubricant systems, including:

- produced the first detailed, co-ordinated, cross-departmental schedule the project team had used
- identified clear overlaps of responsibility across a number of departments
- identified clear interfaces between departments (cutting indiscriminate dissemination of information, and reducing the departmental 'silo mentality'), and
- identified mechanisms to streamline the overall project programme while increasing predictability of completion for market launch

Design planning

From the construction industry (e.g.: design and construction of hospitals, laboratories, etc) to the automotive or aerospace industries (e.g.: development of power units for large commercial aircraft), ADePT has been used on many projects to produce more effective and efficient design processes. The benefits include:

- identification and reduction in the amount of iteration in the design process, leading to...
- ...a reduction in levels of abortive work
- improved co-ordination between team members (key areas of information exchange could be identified and managed through intra-disciplinary design meetings or workshops)
- more robust and predictable design programmes - contractors even allowed the optimal design process to influence and modify traditional construction sequences
- shorter and more robust project programmes, leading to...
- ...increased competitiveness in both design and construction costs

Business benefits

ADePT can help organisations in many areas. Specific benefits include:

- greater predictability of timescales and costs in the development and delivery processes
- shorter lead times and timescales
- lower costs
- greater cross-team visibility - all activities and responsibilities are visible, so it is easy for participants to understand what needs to be done, when and why. By showing everyone how their specific role contributes to the 'big picture', they become more aware of the consequences of their specific actions.
- improved complex processes - by automatically rescheduling the sequence of activities to reduce the number of iterations involved, the overall process is improved
- earlier identification of information needs - teams can highlight activities where information will not be available in time
- better contingency planning and risk management - teams can undertake 'what if' analyses to model differing scenarios and determine the most appropriate management responses, and the information requirements to achieve different specific outcomes can also be modelled.

The Adept Management Service Offering

Many of the challenges facing modern businesses often arise from the complexity of the projects they undertake, which require sophisticated problem solving and decision making. Adept Management help our customers recognise, understand and ultimately overcome these challenges to make them more efficient and effective. Our unique approach to capturing and analysing working processes will help you reduce wastage and increase value through innovative planning, management and implementation practices.

Our consultants have a wealth of industrial and research experience in analysing, planning and managing complex projects. We have extensive experience of business practice and management combined with cutting-edge research. Together, these provide a rich mixture of knowledge, practical experience and implementation skills.

Adept Management Ltd (AML) delivers comprehensive training and consultancy services around ADePT. For more details see www.adeptmanagement.com.