

Implementing the Analytical Design Planning Technique (ADePT)

Feedback from Customers and a project case study

ADePT has been implemented for a number of different customers on differing types of design and engineering projects. Commentary on the benefits of applying ADePT from our customers is included as are details of a specific case study. The application of ADePT clearly shows that the output of multi-disciplinary teams can be co-ordinated much more effectively, providing the team with integrated, robust and most importantly achievable programmes and schedules.

ADePT
Analytical Design Planning Technique

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Some of our Current & Recent Customers



Construction projects ranging in value from £7.5M to £350M, including commercial buildings, residential developments, pharmaceutical facilities, and PFI schools and hospitals.

Complex engineering & development projects including the development of civil aircraft engines and lubricant systems for automotive engines.

Some of their comments from the application of ADePT

"A planning delay meant that with the help of Adept Management we were able to show how a potential 10 day delay could be reduced to 3 days"

"We have been able to get the Architect to reduce fees - fees were based on % of project value but we were able to convince the Architect to reduce these through analysis of actual resource allocation."

"Using ADePT on two of our projects has yielded real benefits and highlighted a great potential to reduce our exposure to risk - particularly on design and build projects - and increase our competitive advantage."

"We felt that a lot of time and effort was saved in weekly design co-ordination meeting as discussions focussed on elements of the project that the whole team were working on. This saved a lot of finger pointing between the designers and stopped the syndrome of "I can't do this until I have information from you."

"We have had little difficulty in persuading our designers to cooperate and use the system and they have concurred in recognising the advantages that can accrue to them in using it."

Introduction the Case Study project

The customer, a medium-sized contractor, was responsible for the planning and management of the design, procurement and construction stages of a £16m residential and commercial development. Adept Management was employed to assist in the development of a robust design programme using ADePT to co-ordinate and optimise the design and procurement processes more effectively. This was undertaken in conjunction with the whole project team.

Commentary on contractor's existing design management practices

The Key Performance Indicators published in 2000 by the CBBP indicated 37% of design commissions overspend and 59% of design commissions are late. These are damning figures and are probably the single biggest factor why, according to the same set of figures, 48% of construction projects overspend and 40% of construction work is late. This level of performance dramatically affects the level of profitability of all contracting organisations, whether in construction or the wider engineering domain.

The design management practices seen on the project were all well established and were as good as any seen on similar projects. A great deal of time and effort was put into producing detailed procurement programmes and linking them to schedules of design information. Although the existing approaches was clearly beneficial to the project, the implementation of ADePT brought improvements in both the effectiveness of the programmes and efficiency of production. Justification of this statement is given as follows:

- The existing programmes were produced in different formats, by different organisations and with varying levels of detail, making it very difficult to co-ordinate across programmes. *All programmes were produced in a single environment allowing co-ordination issues to be easily highlighted between disciplines and between design & procurement.*
- The logic linking and co-ordinating multi-disciplinary (inter-organisation) design activities was not explicit and was difficult to establish. It is these interfaces and the co-ordination of information flowing between activities that give rise to the complexity in design. *All information and interfaces (logic) were held in a single process model to facilitate the co-ordination of all activities across all members of the design team.*
- The original sequence for the delivery of design was driven solely by procurement and with no consideration as to whether the release of information from the design team could actually be achieved (see Figure 1 on next page). Design information for 25% of the 'building' work packages was programmed to be delivered on one day which put an impossible burden on the architects. *The release of design information was streamlined and the optimal design sequence formed the basis for the initial release of information for procurement on. See Figure 2 on next page.*

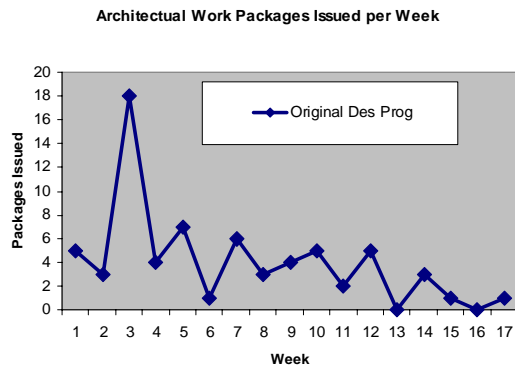
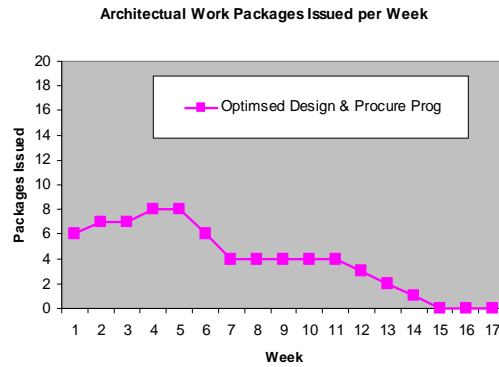


Figure 2: Streamlined release of design information as driven by optimised design & procurement programme

Figure 1: Release of Design Information as driven by original procurement



The existing design programmes were optimistic at best & provided little consideration of how the design should be dovetailed with procurement. It was felt that it was extremely unlikely that the design programmes and information release dates as originally planned would not be met.

Method of Implementation of ADePT

Adept Management have developed templates of design activities on typical building design projects; more importantly these templates contain all the necessary logic and information flows within the design process. These templates were quickly amended to suit the specific requirements of the project and the procurement activities included to produce co-ordinated design and procurement programmes. The following table outlines the steps taken to achieve this.

Step	Description of ADePT Work	Features of Approach
1	Modify design templates to suit requirements of the project, incorporate the Contractor's procurement activities & start on site milestones.	<ul style="list-style-type: none"> Architect, Civil / Structural and M & E design tasks fully integrated with similar levels of detail; All undertaken within same planning environment; All logic inherent across disciplines & with procurement included.
2	Undertake an initial streamlining of design & procurement process by considering initial design compromises to unlock the design process	<ul style="list-style-type: none"> Design activities co-ordinated across the disciplines & procurement; Areas of collaboration needed to deliver an efficient design highlighted (interdependent blocks); Initial design risks and design assumptions were produced to deliver initial design programme.
3	Export the initial ADePT model into PM tool (MS project), add & level resources and impose procurement and Start on site deadlines	<ul style="list-style-type: none"> Resource design activities to give a levelled programme, coherent for design disciplines and project as a whole; Highlights pinch points in the project process; Release of design info streamlined to suit construction sequence.
4	Effect of undertaking design sub-optimally considered and pinch points resolved	<ul style="list-style-type: none"> Procurement dates for 18 work packages were identified that needed to be changed to suit design programme; More realistic release of information from the design team was produced.
5	Production of single, co-ordinated and realistic multi-disciplinary design and procurement programme	<ul style="list-style-type: none"> Potential to reduce the number of work packages issued was identified; & Release of services & architectural design information for construction streamlined into natural clusters.

Conclusions & Benefits

The following benefits were delivered through the application of ADePT on this project:

- The total planning effort to produce a fully co-ordinated detail design programme was no more onerous than current approaches;
- An improved design sequence was achieved without compromising the construction process, nor end date;
- By working collaboratively with all the design consultants to develop the programme and resolve pinch points, the team benefited from identifying gaps and overlaps in design scope and responsibility. The resolution of these meant that the project team were more integrated.
- Design solutions stood a greater chance of being properly co-ordinated, with less resultant defects, as collaboration opportunities were identified and programmed to occur (interdependent blocks);
- An increase in design team efficiency was realised as release of information for procurement was streamlined into natural clusters and also to match the construction sequence;
- The potential for a major surprise(s) [to the Contractor] was reduced significantly as a result of a co-ordinated design & procurement programme;
- Increased predictability of programmes was achieved from the more realistic programme and the associated buy in from the design team.
- The project risk was reduced through the explicit identification of design compromises and assumptions.
- ADePT was not seen as a threat to designers, and was offered as a method to help designers' influence their own delivery process, rather than have it imposed.

It is concluded that the timely implementation of ADePT made the Contractor's design planning and management processes more effective and efficient. This increased the predictability of achieving design and ultimately construction deadlines, which in turn minimised the potential for major surprises on projects. In time these benefits would reduce both project costs and delivery overruns associated with design re-work, abortive work, and the resulting construction hold-ups.

Appendix

Step 1

Modify design templates to suit requirements of the project, incorporate the contractor's activities & start on site milestones and undertake initial optimisation of design process.

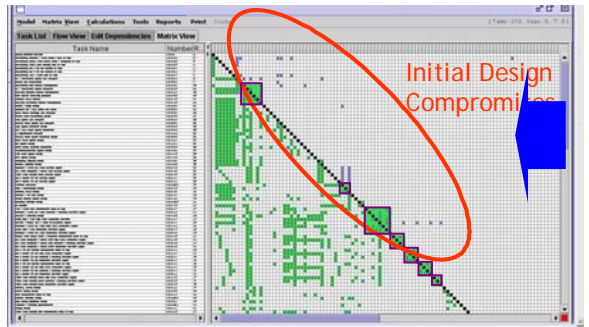
Task	Name	Duration	Responsibility
A.0	External Roads to Design	0	
A.1	ARCHITECTURAL DESIGN	0	Wojtek
A.2	TOTAL ENGINEERING DESIGN	0	White Young Green
A.2.1	Site Plans Design	0	White Young Green
A.2.2	Sub-Structure Design	0	White Young Green
A.2.3	Foundations Design	0	White Young Green
A.2.3.1	Site Design	0	White Young Green
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Step 2

Undertake an initial streamlining of design & procurement process within software by considering initial design compromises to unlock the design process. These design compromises form the basis of a schedule of risks associated with design

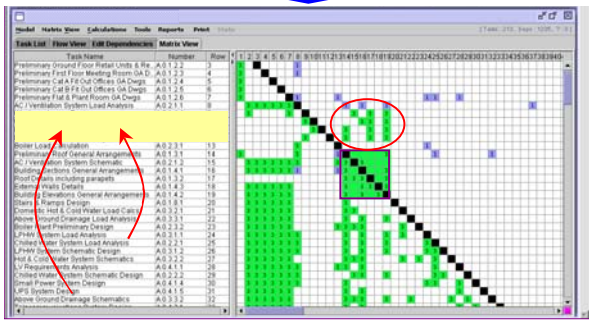
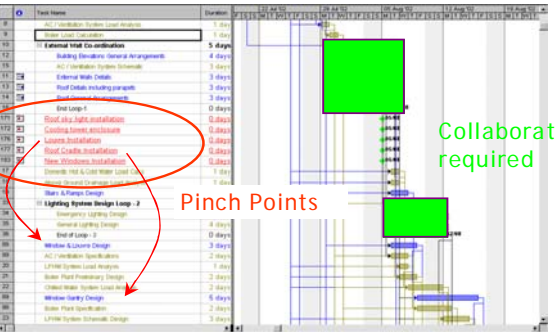
Step 3

Export the initial model into PM tool, add and level resources and impose procurement and start on site deadlines. Pinch points are identified for resolution.



Step 4

Programme re-imported into software & effect of undertaking design sub-optimally considered and pinch points resolved by consideration of whole team



Step 5

Production of single, co-ordinated and realistic multi-disciplinary design and procurement programmes