UNLEASH THE POWER OF LIMITLESS CONNECTIVITY
Operational Transformation

Having the Whole Company in a Bag

Ian Oliver
President
Versant Solutions Group
WHY AUTOMATED DESIGN AND OPTIMIZATION?

Business and Operational Challenges

- New transmission technologies offering excellent performance but making the capex decision-making process more challenging
- A network footprint that comprises relatively dense urban, medium-density suburban, and low-density rural environments, requiring unique design considerations
- The need to deploy network upgrades in the shortest possible time to maximize ROI and to keep customers satisfied
- Very long lead times for delivery of equipment and materials which is causing painful delays in network deployments
- The requirement to regularly review and modify the long-term network technology and architecture strategy
WHY AUTOMATED DESIGN AND OPTIMIZATION?

Pilot Project – Goals and Results

• Preliminary designs for N+2 architecture access network per Mediacom’s design rules and equipment specifications
• Optimal locations of new nodes to minimize node count
• Fully calculated, technically valid RF plant design
• Optimal routing of new fiber cable as required to connect new nodes to the existing fiber plant
• Integration with Mediacom’s existing GIS/network engineering platform
• Increased effectiveness and productivity of Mediacom’s existing network planning team
• Savings of time and cost relative to manual planning and design methods
WHY AUTOMATED DESIGN AND OPTIMIZATION?

Designs, not Models, are the Whole Company in a Bag

Models typically consist of:
- manually produced preliminary designs and cost estimates for a handful of nodes
- spreadsheets of extrapolations of those cost estimates across a larger footprint
- additional cost allowance (e.g. 20%) to ensure that final cost estimate is not too low

ADO produces preliminary designs, complete with:
- fully detailed bills-of-materials for all equipment and cable
- details of all construction activities (replace, remove, turn around, etc.)
- Cost estimates for all equipment, cable, and construction activities per Mediacom’s standard costing figures

With all that ADO delivers – for every node in the network – Mediacom gets the Whole Company in a Bag
ADO ENVIRONMENT OVERVIEW

• Design Rules set for each network architecture with selected configuration allowed at user level
• As-built designs pulled from GIS/Eng. Database and preliminary designs returned
• Preliminary designs, BoMs & cost estimate viewable in web-based user interface
Map View

- N+X preliminary designs
- X = zero or greater
- Design Rules preset at corporate level with some user configuration allowed
- Map view is geo-registered to land-base
- Satellite and street views provided
Schematic View

- Supports rapid analysis of network design for each selected architecture
- Configurable to give different users the information they need
- Shows changes made to as-built design to achieve new architecture
### Bills of Materials and Cost Estimates

- Fully detailed down to individual node
- Can be rolled up to Hub, Headend, Region, and Whole Company levels
- Every item of equipment and every work action is counted and costed
- Corporate costing figures utilized for consistency

<table>
<thead>
<tr>
<th>Existing Node</th>
<th>Designed Sub Node</th>
<th>Service Locations Passed</th>
<th>Optical Path Length</th>
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<td>Design Profile: Mediacom 750 S A S</td>
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<td>SDU</td>
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| Designed (node 2 of 4): Mediacom 1000 G1 | Port | SDU | MDU | COM | OTHER | TOTAL |
| | A | 25 | 0 | 5 | 0 | 30 |
| | B | 22 | 0 | 3 | 0 | 25 |
| | C | 11 | 0 | 0 | 0 | 11 |
| | D | 28 | 0 | 2 | 0 | 28 |
| Node Total | 83 | 0 | 10 | 0 | 93 |

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WORKFLOW IMPROVEMENTS

All the Players

- Investors
- Franchise Authorities
- Senior Management
- Corporate & Regional Planners
- Design Contractors
- Construction Contractors
- IP Network Group
- Finance
- Procurement
- Vendors
- Whole Company in a Bag
- GIS/Engineering Database
Network Planning and Approval

1. Preliminary Designs, BoMs, Costing
2. Recommendations for Upgrades
3. Budget Planning and Approval
4. Equipment and Material Forecasts
5. Negotiation with Vendors
6. Procurement Planning and Approval
7. Orders and Delivery Requirements

- Whole Company in a Bag
- GIS/Engineering Database
- Senior Management
- Corporate & Regional Planners
- Design Contractors
- Finance
- Procurement
- Vendors
- Investors
- Franchise Authorities
WORKFLOW IMPROVEMENTS

Network Upgrade Implementation

1. Direction to do Construction Set
2. Push Prelim Design to GIS/Eng D'base
3. Do Construction Set & As-Builts
4. Construction Set & Mark-ups
5. Delivery Dates
6. Upgraded Network Design
7. As-built Details

Whole Company in a Bag

GIS/Engineering Database
WORKFLOW IMPROVEMENTS

External Communications

1. Preliminary Designs, BoMs, Costing
2. Network Upgrade Capex Planning
3. Network Upgrade Plans

- Investors
- Franchise Authorities
- Senior Management
- Corporate & Regional Planners
- Design Contractors
- Construction Contractors
- IP Network Group
- Vendors

Whole Company in a Bag
GIS/Engineering Database
SUMMARY AND CONCLUSIONS

Benefits and Improvements

- ADO technology enables faster and more comprehensive evaluation of the technical and capital costs characteristics of access network designs.
- ADO technology – specifically, the data within the preliminary designs and cost estimates it produces so rapidly – has conferred benefits on practically every group within Mediacom involved in the funding, design, construction, and operation of the access network.
- The increase in confidence gained by having easy access to preliminary designs and cost estimates for multiple network architectures has allowed Mediacom to execute its access network upgrade strategy significantly more efficiently and effectively.
- The ability to work with external groups – investors, franchise authorities, and vendors – has also been enhanced by clearly and consistently providing each of those groups with information they need to best understand and support Mediacom’s access network upgrade strategy.
Further Opportunities

- As Mediacom gains more experience with ADO technology, it is anticipating opportunities for
  - Automation of the design of
    - power distribution for HFC networks
    - the fiber optic portion of HFC networks
    - greenfield FTTH networks
  - Making the ADO platform – and access network design data therein – increasingly available to everybody in the company who cares about the access network
Thank You!

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