Impact Tree Builder: Product Requirements Document

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Executive Summary

This document outlines the requirements for building an Impact Tree visualization and management application based on Martin Fowler's Impact Intelligence methodology. The application enables organizations to create, visualize, and manage impact networks that connect business initiatives to measurable outcomes.

Background & Problem Statement

As detailed in Martin Fowler's article on Impact Intelligence, many technology organizations struggle with understanding the business impact of their initiatives. The lack of **impact intelligence** leads to:

- Feature factories that produce output without clear business value
- Difficulty justifying technology investments to executives
- Misaligned focus on developer productivity instead of business outcomes
- Inability to validate whether initiatives deliver expected benefits

The Impact Tree Builder addresses these challenges by providing a visual tool for mapping and tracking the relationship between initiatives and their business impact.

Core Concepts from Martin Fowler's Framework

Impact Intelligence Definition

Impact Intelligence is the constant awareness of the business impact of initiatives through tracking contribution to key business metrics, not just low-level metrics in proximity to an initiative.

Impact Network Structure

The impact network follows a hierarchical structure with specific visual conventions:

Visual Elements:

- **Green arrows**: Desirable effects
- **Red arrows**: Undesirable effects
- **Blue arrows**: Rollup relationships
- **Black arrows**: Expected impact of functionality
- **Solid lines**: Direct relationships
- **Dashed lines**: Inverse relationships

Hierarchy Levels:

1. **Top Level**: Business metrics (downstream impact)
2. **Middle Level**: Service/product metrics
3. **Bottom Level**: Features/initiatives (proximate impact)

Impact Types

Proximate Impact:

- Direct or first-order impact
- Easier to notice and claim credit for
- Examples: chatbot session success rate, email open rates

Downstream Impact:

- Indirect, higher-order impact
- Occurs further down the line
- May be influenced by multiple factors
- Examples: cost reduction, revenue increases

Functional Requirements

FR1: Impact Tree Management

- **FR1.1**: Create new impact trees with metadata (name, description, owner, dates)

- **FR1.2**: Load and save impact tree data

- **FR1.3**: Export impact trees to JSON format

- **FR1.4**: Import impact trees from JSON format

- **FR1.5**: Support multiple impact trees per user

FR2: Node Management

- **FR2.1**: Create nodes representing different entity types:

  - Business metrics (top level)

  - Product/service metrics (middle level)

  - Initiatives/features (bottom level)

- **FR2.2**: Edit node properties:

  - Name and description

  - Node type and level

  - Visual properties (color, shape, position)

- **FR2.3**: Delete nodes with relationship cleanup

- **FR2.4**: Drag and drop nodes to reposition

- **FR2.5**: Visual differentiation by node type:

  - Business metrics: Green rectangles

  - Product metrics: Blue rectangles

  - Positive initiatives: Orange ellipses

  - Negative initiatives: Red ellipses

FR3: Relationship Management

- **FR3.1**: Create relationships between nodes by drag and connect

- **FR3.2**: Support relationship types:

  - Desirable effects (green arrows)

  - Undesirable effects (red arrows)

  - Rollup relationships (blue arrows)

  - Expected impact (black arrows)

- **FR3.3**: Configure relationship properties:

  - Line style (solid/dashed)

- Strength/weight
- Description
- **FR3.4**: Edit and delete relationships
- **FR3.5**: Prevent circular dependencies

FR4: Measurement Tracking

- **FR4.1**: Add measurement data to nodes:
  - Expected values
  - Actual values
  - Measurement dates and periods
  - Impact type (proximate/downstream)
- **FR4.2**: Calculate performance metrics:
  - Return on Projection (ROP) ratios
  - Performance indicators (green/red status)
- **FR4.3**: Display measurement trends over time
- **FR4.4**: Support multiple measurements per node

FR5: Visualization Engine

- **FR5.1**: Interactive canvas with zoom and pan capabilities
- **FR5.2**: Responsive layout adapting to different screen sizes
- **FR5.3**: Hover tooltips showing node details and measurements
- **FR5.4**: Visual indicators for node performance status
- **FR5.5**: Smooth animations for interactions

FR6: User Interface

- **FR6.1**: Left sidebar with:
  - Tree information panel
  - Node creation tools
  - Relationship management
  - Measurement tracking
- **FR6.2**: Main canvas area for visualization
- **FR6.3**: Right sidebar with:
  - Selected element properties
  - Measurement data entry
  - Performance charts

- **FR6.4**: Top toolbar with:
  - Save/load functions
  - Export options
  - View controls

Data Model

Core Entities

ImpactTree

```
- id: string (unique identifier)
- name: string (tree name)
- description: string (tree purpose)
- created_date: date
- updated_date: date
- owner: string (creator/owner)
```

Node

```
- id: string (unique identifier)
- tree_id: string (foreign key)
- name: string (node name)
- description: string (detailed description)
- node_type: enum (business_metric, product_metric, initiative, feature)
- level: integer (hierarchy level 1-3)
- position_x: number (canvas x coordinate)
- position_y: number (canvas y coordinate)
- color: string (hex color code)
- shape: enum (rectangle, ellipse)
```

Relationship

```
- id: string (unique identifier)
- source_node_id: string (foreign key)
- target_node_id: string (foreign key)
- relationship_type: enum (desirable_effect, undesirable_effect, rollup, expected_impact)
- line_style: enum (solid, dashed)
- color: string (hex color code)
- strength: number (0.0 to 1.0)
- description: string (relationship explanation)
```

Measurement

```
- id: string (unique identifier)
- node_id: string (foreign key)
- metric_name: string (measurement name)
- expected_value: number (projected value)
```

```
  - actual_value: number (measured value)
  - measurement_date: date
  - measurement_period: enum (daily, weekly, monthly, quarterly)
  - impact_type: enum (proximate, downstream)
```

Relationships

- ImpactTree → Node (one-to-many)

- Node → Relationship (many-to-many via source/target)

- Node → Measurement (one-to-many)

Technical Requirements

TR1: Technology Stack

- **Frontend**: HTML5, CSS3, JavaScript (ES6+)

- **Visualization**: SVG or HTML5 Canvas

- **Storage**: Browser localStorage for persistence

- **Architecture**: Single-page application (SPA)

TR2: Performance

- **TR2.1**: Support impact trees with up to 100 nodes

- **TR2.2**: Smooth interactions with sub-100ms response times

- **TR2.3**: Efficient rendering for complex visualizations

TR3: Compatibility

- **TR3.1**: Modern browsers (Chrome, Firefox, Safari, Edge)

- **TR3.2**: Responsive design for desktop and tablet devices

- **TR3.3**: No external dependencies beyond standard browser APIs

TR4: Data Management

- **TR4.1**: Automatic save to localStorage on changes

- **TR4.2**: Data validation and error handling

- **TR4.3**: Backup and restore capabilities

User Experience Requirements

UX1: Usability

- **UX1.1**: Intuitive drag-and-drop interface
- **UX1.2**: Clear visual hierarchy and information architecture
- **UX1.3**: Contextual help and tooltips
- **UX1.4**: Undo/redo functionality for major operations

UX2: Accessibility

- **UX2.1**: Keyboard navigation support
- **UX2.2**: High contrast color schemes
- **UX2.3**: Screen reader compatibility
- **UX2.4**: Alternative text for visual elements

UX3: Professional Design

- **UX3.1**: Clean, business-appropriate visual design
- **UX3.2**: Consistent color scheme and typography
- **UX3.3**: Professional iconography and visual elements

Success Metrics

Primary Metrics

- **User Adoption**: Number of active users creating impact trees
- **Tree Complexity**: Average number of nodes and relationships per tree
- **Measurement Usage**: Percentage of nodes with associated measurements
- **Export Activity**: Frequency of tree exports for sharing

Secondary Metrics

- **Session Duration**: Time spent actively using the application
- **Feature Usage**: Adoption rates of advanced features
- **User Retention**: Return usage over time periods

Implementation Phases

Phase 1: Core Functionality (MVP)

- Basic node and relationship creation
- Simple visualization engine
- Local storage persistence

- Essential UI components

Phase 2: Enhanced Features

- Measurement tracking and ROP calculations

- Advanced visualization options

- Import/export capabilities

- Performance optimizations

Phase 3: Advanced Capabilities

- Multiple tree management

- Collaboration features

- Advanced analytics and reporting

- Integration APIs

Risk Assessment

Technical Risks

- **Browser compatibility issues**: Mitigated through progressive enhancement

- **Performance with large trees**: Addressed through virtualization techniques

- **Data loss**: Prevented through robust backup mechanisms

User Adoption Risks

- **Learning curve**: Reduced through intuitive design and onboarding

- **Integration complexity**: Simplified through export/import features

- **Change resistance**: Addressed through clear value demonstration

Conclusion

The Impact Tree Builder provides a critical tool for implementing Martin Fowler's Impact Intelligence methodology. By visualizing the connections between initiatives and business outcomes, organizations can move beyond productivity metrics to focus on actual business impact. The application supports the complete lifecycle from tree creation to measurement tracking, enabling data-driven decision making about technology investments.

The modular design and phased implementation approach ensure the application can evolve with user needs while maintaining a focus on core impact intelligence principles. Success will be measured not just by user adoption, but by the application's ability to improve organizational understanding of initiative impact and business value creation.

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