# **Universal Dashboard Generation Framework**

## **A Project-Agnostic Guide for Creating Quality KPI Dashboards**

### **1. CORE PRINCIPLES**

#### **1.1 Design Philosophy**

* **Zero Manual Intervention**: Dashboard must open without Excel repair prompts
* **Complete Automation**: All calculations via formulas, no manual updates required
* **Single Source of Truth**: One unified data model drives all views
* **Cascading Updates**: Changes in source data automatically flow through all dependent sheets
* **Error Resilience**: Every formula wrapped in error handling

#### **1.2 Universal Success Criteria**

****Technical Excellence:

- No #ERROR values in any cell

- No circular references

- All formulas use IFERROR wrapping

- Sheet dependencies resolve without forward references

User Experience:

- Executive summary readable in 30 seconds

- Visual indicators (colors) convey status instantly

- Drill-down path from summary to detail is intuitive

- Data entry points clearly marked

Data Integrity:

- All percentages between 0-100%

- All dates in valid ranges

- Budget totals reconcile within ±0.5%

- No orphaned references

### **2. UNIVERSAL INPUT PROCESSING**

#### **2.1 Document Classification Framework**

****UNIVERSAL\_DOCUMENT\_TYPES = {

"Strategic": ["strategy", "plan", "vision", "objectives", "goals"],

"Operational": ["timeline", "schedule", "milestone", "deliverable"],

"Financial": ["budget", "cost", "expense", "financial", "funding"],

"Performance": ["kpi", "metric", "indicator", "measure", "target"],

"Resources": ["staff", "role", "team", "capacity", "roster"],

"Risk": ["risk", "issue", "mitigation", "threat", "vulnerability"],

"Progress": ["status", "update", "report", "progress"],

"Stakeholder": ["partner", "client", "vendor", "stakeholder"]

}

#### **2.2 Universal Entity Extraction**

****Always Extract:

- Objectives/Goals (what are we trying to achieve?)

- Activities/Tasks (what needs to be done?)

- Metrics/KPIs (how do we measure success?)

- Targets/Thresholds (what defines success?)

- Deadlines/Milestones (when must things happen?)

- Owners/Responsibilities (who is accountable?)

- Resources/Budget (what do we need?)

- Risks/Issues (what could go wrong?)

- Dependencies (what relies on what?)

### **3. UNIVERSAL DATA MODEL (UDM)**

#### **3.1 Core Objects (Adapt to Any Project)**

****@dataclass

class UniversalProgram:

name: str

period: DateRange

organizational\_units: List[OrgUnit] # Sites, departments, teams, etc.

total\_budget: Decimal

@dataclass

class OrgUnit:

name: str

identifier: str

color: str # For visual distinction

responsible\_party: Optional[Person]

@dataclass

class Objective:

id: str

description: str

parent: Optional[str] # For hierarchical objectives

success\_criteria: List[str]

@dataclass

class Metric:

name: str

category: str

unit\_of\_measure: str

target\_value: float

frequency: Literal["Daily", "Weekly", "Monthly", "Quarterly", "Annual"]

calculation\_method: str

thresholds: Dict[str, float]

@dataclass

class WorkItem: # Universal task/activity

objective\_ref: str

description: str

owner: Optional[Person]

org\_unit: Optional[OrgUnit]

deadline: date

status: str

progress: float

dependencies: List[str]

### **4. UNIVERSAL EXCEL STRUCTURE**

#### **4.1 Essential Sheet Framework (Order Matters)**

****Core Sheets (Minimum Required):

1. Executive Dashboard:

Purpose: One-page overview for leadership

Contents: KPI summary, status matrix, risk heat map, budget gauge

2. KPI Tracker:

Purpose: All metrics with period comparisons

Contents: Current vs Target, Trend, RAG status

3. Work Management:

Purpose: All tasks/activities/deliverables

Contents: Owner, deadline, status, progress, dependencies

4. Resource Allocation:

Purpose: People, budget, capacity

Contents: Planned vs actual, utilization rates

5. Risk Register:

Purpose: Issues and mitigations

Contents: Severity, probability, impact, owner, status

6. Timeline/Calendar:

Purpose: Visual schedule

Contents: Milestones, deadlines, dependencies

Supporting Sheets (Add as Needed):

- Detailed breakdowns by org unit

- Stakeholder-specific views

- Data input forms

- Historical tracking

- Reference data (hidden)

#### **4.2 Universal Column Patterns**

****Task/Activity Columns:

[ID | Objective | Description | Owner | Unit | Start | End | Progress% | Status | RAG | Dependencies | Notes]

Metric Columns:

[Metric | Category | Target | Actual | Variance | Variance% | Trend | RAG | Period | Notes]

Resource Columns:

[Resource | Type | Unit | Planned | Actual | Variance | Utilization% | Cost | Notes]

Risk Columns:

[Risk | Category | Probability | Impact | Score | Mitigation | Owner | Status | Review Date]

### **5. UNIVERSAL FORMULA PATTERNS**

#### **5.1 Core Formula Library**

****# Status Calculations

Status = IF(Progress=1,"Complete",IF(Progress>0,"In Progress","Not Started"))

Overdue = AND(TODAY()>Deadline,Status<>"Complete")

Days\_Remaining = MAX(0,Deadline-TODAY())

# Progress Calculations

Overall\_Progress = IFERROR(Tasks\_Complete/Total\_Tasks,0)

Weighted\_Progress = IFERROR(SUMPRODUCT(Progress,Weight)/SUM(Weight),0)

# Performance Calculations

Achievement% = IFERROR(Actual/Target,0)

Variance = Actual-Target

Variance% = IFERROR((Actual-Target)/Target,0)

# RAG Status (Universal Thresholds)

RAG = IF(Achievement>=1,"GREEN",IF(Achievement>=0.8,"AMBER","RED"))

# Period Calculations

Current\_Month = SUMIFS(Values,Dates,">="&EOMONTH(TODAY(),-1)+1,Dates,"<="&EOMONTH(TODAY(),0))

YTD = SUMIFS(Values,Dates,">="&DATE(YEAR(TODAY()),1,1),Dates,"<="&TODAY())

Rolling\_Average = IFERROR(AVERAGE(OFFSET(Current,-11,0,12,1)),0)

# Resource Calculations

Utilization = IFERROR(Actual\_Hours/Available\_Hours,0)

Burn\_Rate = IFERROR(Spent/Budget,0)

Run\_Rate = IFERROR(Spent/Days\_Elapsed\*Days\_Total,0)

#### **5.2 Error Handling Standards**

****# Always wrap potentially error-prone operations

Safe\_Divide = IFERROR(Numerator/Denominator,0)

Safe\_Lookup = IFERROR(VLOOKUP(...),"Not Found")

Safe\_Average = IFERROR(AVERAGE(Range),0)

Safe\_Percentage = IFERROR(Value/Total,0)

### **6. UNIVERSAL VISUAL STANDARDS**

#### **6.1 Color Palette (RAG + Extensions)**

****Performance Colors:

Excellent: #C6EFCE (Light Green)

Good: #E6F4EA (Very Light Green)

Warning: #FFEB9C (Light Amber)

Alert: #FFC7CE (Light Red)

Critical: #FF6B6B (Dark Red)

Status Colors:

Complete: #C6EFCE

On Track: #E6F4EA

At Risk: #FFEB9C

Delayed: #FFC7CE

Blocked: #D3D3D3

Data Categories (Distinct Colors):

Category1: #4ECDC4 (Teal)

Category2: #45B7D1 (Blue)

Category3: #96CEB4 (Mint)

Category4: #FFEAA7 (Yellow)

Category5: #DDA0DD (Plum)

#### **6.2 Conditional Formatting Rules**

****Universal Rules:

Percentages:

≥100%: Green fill

80-99%: Light green

60-79%: Yellow

40-59%: Light orange

<40%: Red

Dates:

Overdue: Red fill + bold

Due Today: Orange fill

Due This Week: Yellow fill

Variances:

Positive: Green text

Negative >10%: Red text + bold

Text Status:

Apply color based on Status Colors above

### **7. UNIVERSAL VALIDATION RULES**

#### **7.1 Data Validation Patterns**

****Standard Dropdowns:

Status: [Complete, In Progress, Not Started, On Hold, Cancelled]

Priority: [Critical, High, Medium, Low]

RAG: [Green, Amber, Red]

Frequency: [Daily, Weekly, Monthly, Quarterly, Annual]

Date Validation:

Format: MM/DD/YYYY

Range: Project start date to +2 years

Message: "Enter date as MM/DD/YYYY"

Percentage Validation:

Type: Decimal

Range: 0 to 1

Display Format: 0%

Message: "Enter value between 0 and 100%"

### **8. QUALITY ASSURANCE CHECKLIST**

#### **8.1 Pre-Delivery Validation**

****Formula Checks:

☐ No #ERROR, #DIV/0, #REF values

☐ All IFERROR wrapping in place

☐ No hardcoded values in formulas

☐ All ranges use structured references or named ranges

Data Integrity:

☐ Totals foot correctly (±0.5%)

☐ No duplicate IDs

☐ All required fields populated

☐ Dates in chronological order

Visual Checks:

☐ Conditional formatting applied

☐ Colors match RAG status

☐ Headers formatted consistently

☐ Print areas set appropriately

Performance:

☐ Opens without repair prompt

☐ Calculates in <5 seconds

☐ File size <50MB

### **9. IMPLEMENTATION WORKFLOW**

#### **9.1 Standard Build Process**

****graph TD

A[Gather Documents] --> B[Extract Requirements]

B --> C[Map to UDM]

C --> D[Design Dashboard Structure]

D --> E[Build Core Sheets]

E --> F[Add Formulas]

F --> G[Apply Formatting]

G --> H[Add Validation]

H --> I[Test with Sample Data]

I --> J[Document Formulas]

J --> K[Final QA]

K --> L[Deliver]

#### **9.2 Processing Decision Tree**

****For Each Input Document:

1. Classify document type

2. Extract relevant entities based on type:

Strategic → Goals, objectives, success criteria

Operational → Tasks, milestones, dependencies

Financial → Budget lines, costs, resources

Performance → KPIs, targets, thresholds

3. Map to appropriate UDM object

4. Determine dashboard placement

5. Generate appropriate formulas

### **10. ADAPTABILITY GUIDELINES**

#### **10.1 Customization Points**

****Flexible Elements:

- Number and names of organizational units

- Specific KPI categories and calculations

- Additional sheets for domain-specific needs

- Custom status values and workflows

- Industry-specific terminology

Fixed Elements (Don't Change):

- Error handling approach

- RAG logic (Green/Amber/Red)

- Core sheet dependencies

- Formula patterns

- Date handling

#### **10.2 Scaling Considerations**

****Small Projects (<100 tasks):

- Combine related sheets

- Simplify to 5-7 core sheets

- Monthly reporting frequency

Medium Projects (100-1000 tasks):

- Full sheet structure

- Weekly/Monthly dual reporting

- Add drill-down sheets

Large Projects (>1000 tasks):

- Add summary roll-up sheets

- Implement data archiving

- Consider PowerBI/Tableau integration

- Add automated data import sheets

### **11. DOCUMENTATION STANDARDS**

#### **11.1 Formula Documentation Template**

****Formula Name: [Descriptive name]

Location: [Sheet!Cell or Range]

Purpose: [What it calculates]

Inputs: [Required data/ranges]

Calculation: [Step-by-step logic]

Error Handling: [How errors are managed]

Update Frequency: [When it recalculates]

Dependencies: [What must exist first]

#### **11.2 User Guide Structure**

****1. Dashboard Overview

- Purpose and objectives

- Key metrics tracked

- Update frequency

2. Data Entry Guide

- Where to input data

- Required vs optional fields

- Validation rules

3. Understanding the Metrics

- KPI definitions

- Calculation methods

- Target explanations

4. Troubleshooting

- Common errors and fixes

- Performance optimization

- Contact information

### **12. UNIVERSAL ACCEPTANCE CRITERIA**

#### **12.1 Minimum Viable Dashboard**

****Must Have:

✓ Executive summary with KPI status

✓ Detailed task/activity tracking

✓ Progress indicators (%, RAG)

✓ Timeline/deadline visibility

✓ Resource utilization view

✓ Risk identification

✓ No manual calculations required

✓ Opens without errors

Nice to Have:

- Historical trending

- Predictive analytics

- Interactive charts

- Automated email reports

This framework provides a comprehensive, project-agnostic approach to creating quality dashboards. Apply these patterns consistently while adapting terminology and specific metrics to match your project's unique requirements.