

Managing a Green Giant: Sustainability Performance Management, a User Experience Perspective

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Abstract. With a backdrop of global resource depletion, climate change, and environmental degradation, there's growing pressure on businesses (especially big business) to change course, to conduct themselves sustainably. Given SAP's mission to not just sell software, but to "help the world run better," it is well positioned to advance the cause of sustainable business. This paper summarily defines the topic of Sustainability Performance Management and the objectives of a business software product designed for the space. In greater detail, it addresses the research methods, design process, and development collaboration model employed during the development of SAP Sustainability Performance Management (SuPM).

Keywords: Sustainability, Performance Management, Operational Performance, Key Performance Indicators, Key Performance Drivers, Management Framework, GRI, DJSI, CDP, Analysis, Reporting, Agile.

1 Introduction

"Sustainability is increasingly mission-critical across the corporate world... It is becoming a key element of business strategy, with the potential to deliver new levels of efficiency and operational performance, innovation and organizational transformation."

- Dr. Stephen Stokes, VP of Sustainability & Green Technologies, AMR Research

Perhaps it's increasingly mission-critical... but what exactly is "Sustainability" in the "corporate world"? Perhaps the best definition comes from analogy to existent business practice, by way of characterizing sustainability as "triple bottom line accounting": triple bottom line accounting means expanding the traditional concepts around performance and reporting to account for not just financial performance, but also ecological and social performance.

Returning to Dr. Stokes: "Managing and reporting an organization's sustainable performance via transparent and high quality data collation, analysis, optimization and modeling is a new basis for defining and communicating operational excellence." As is the case with other measures of operational performance, such a new basis of operational excellence will undoubtedly rely heavily on business software. SAP organized around this opportunity in 2008, and established the foundation for what was to become SAP Sustainability Performance Management (SuPM).

SAP SuPM was envisioned to support the following objectives:

- Incorporate social and environmental issues and data into mainstream business practices and processes
- Reduce the cost and increase the reliability of gathering environmental and social performance metrics
- Reduce the complexity of preparing reports based upon multiple different sustainability reporting requirements
- Make sustainability actionable
- Improve visibility of sustainability-relevant key performance drivers
- Support reporting at relevant levels of the organization (e.g., plant/building, country, region, global)
- Provide a management framework for guiding improvement

In this paper, we will review the research methods, design process, and development collaboration model employed for Sustainability Performance Management.

2 Research Process and Deliverables

User research activities aimed to gain an understanding of the high-level business process, customer pain points, user profiles, as well as key tasks.

The nascency of the Sustainability Performance Management domain presented research challenges, insofar as best-practice business processes have not been established within industries, much less spanning industry categories. While NGOs such as the Global Reporting Initiative (GRI), Carbon Disclosure Project (CDP), and Dow Jones Sustainability Index (DJSI) provide guidelines and frameworks for publicly disclosing aspects of sustainability performance, they fall short of prescribing specific internal processes to collect, manage, and act on sustainability metrics.

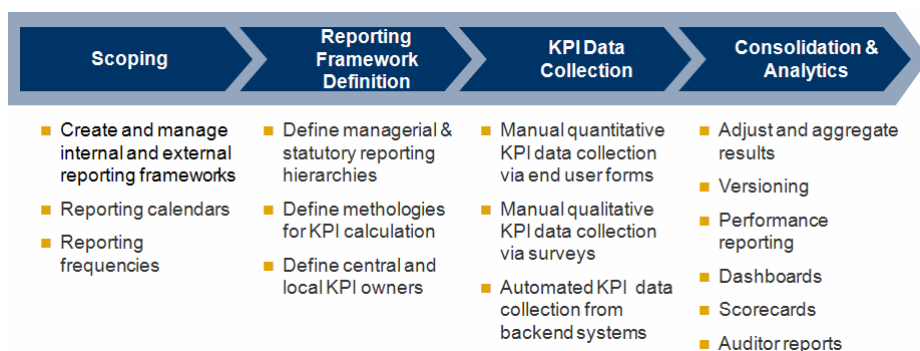


Fig. 1. SAP SuPM process phases associated tasks

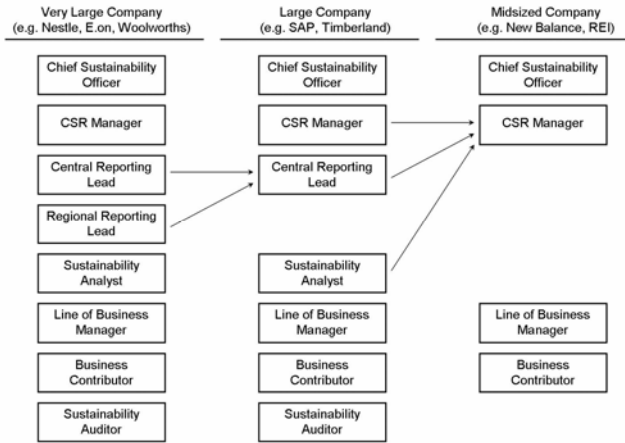


Fig. 2. Role consolidation correlated to company size

Table 1. Excerpt from SAP SuPM 1.0 Role-Task Matrix

	Candidate for Integration or Reuse	Chief Sustainability Officer	Sustainability Team Lead	Sustainability Team Member	Business Contributor
Scoping					
Create/Update/Change Stakeholder Categories			X		
Select reporting frameworks and application levels		X	X		
Create new reporting framework and assign candidate KPI's		X	X	X	
Create stakeholders			X	XX	X
Create/update stakeholder profile				XX	X
Define process for application levels of new reporting framework			X	X	
Define business contributors for a stakeholder risk assessment			XX	XX	
Issue stakeholder risk assessment		X	X		
Respond to stakeholder risk assessment (and create stakeholder profile)		X			X
Review and adjust stakeholder risk assessment results		X	X		
Create/edit stakeholder survey				X	
Issue stakeholder feedback survey			X		
Respond to stakeholder feedback survey					XX
Review stakeholder feedback and finalize report scope (materiality analysis)		X	X		

Taking an opportunistic, breadth-before-depth approach to the customer and user research, SAP User Experience (UX) defined a research plan consisting of business process walkthroughs, remote phone-based interviews, as well as contextual

interviews. In the initial product definition phase, we worked with eight companies to arrive at and refine a standard process for sustainability performance management (with an orientation mostly toward disclosure, at this time), along with the primary features/functions and tasks associated with each phase.

User-level research revealed the key roles involved with the process, as well as how the roles vary in proportion to an organization's size. The key roles identified across all companies, regardless of size, were the Chief Sustainability Officer, Corporate Social Responsibility (CSR) Manager, and the Line of Business Manager. In larger companies, it was common to find greater specialization and differentiation, with roles such as Sustainability Analysts, Central Sustainability Reporting Lead, and Regional Reporting Leads. In order to define a role-based user experience that would easily scale within the observed variability, we mapped how role-based responsibilities consolidated as company size shrank:

Combining customer-level business process research with user-level task research yielded the role-task matrix, the foundation on which the role-based information architecture could be designed.

3 Design Activities and Collaboration Model

Based upon the market and customer knowledge gleaned during the research phase, the leadership in Product Management determined that a version 1.0 release within the calendar year 2009 was essential to establish SAP's place in the incipient market. Such a release-date driven schedule contributed to the team's decision to employ Agile Development methods for the release, an atypical approach within SAP at the time. We embraced a fixed-timeline, variable-scope mentality, and scheduled eight three-week development sprints.

A globally distributed team was formed, consisting of:

- Two Solution Managers in Palo Alto, California, with an assistant later joining in Walldorf, Germany
- A team of twelve Developers and QA Specialists located in Bangalore, India
- Two UX Designers in Bangalore, with a Principal UX Designer in Palo Alto
- Consulting Development Architects in Walldorf

Detailed product definition and UX design activities were aligned with development sprints such that requirements, use cases, and UX designs were prepared exactly one sprint before development would build the features. Within the inbound product definition work stream, each sprint included:

- Co-design (between Product Management and UX) of interaction flows, wireframes, and high-fidelity mockups—a highly collaborative design process that often consisted of half-day working sessions
- Publication of use cases, interaction flows, and mockups on an internal wiki.

Title: Automated KPI Collection - Maintain Scripts

Executive Summary

Customers will want to leverage as much data as possible from their existing production SAP systems. Automated KPI collection is SR's means of accomplishing this leveraging SAPQuery, BW Queries and web services. Highly similar functionality has been implemented twice before in Process Control and Risk Management. This implementation is in many ways a simplified version with some unique integration to Sustainability Reporting master data. Alex Wussow can help with this implementation.

Steps

Step	User Interaction	UI Data	Ux Mockup	Validations	Discussion
Main success case					
1	Click on "Maintain Script Library"	<ul style="list-style-type: none"> - Script name - Script description - System name - Target connector - Script type 		<ul style="list-style-type: none"> - Supports "create, open, delete, copy" actions - Script type can be "SAP Query," "BW Query" or "Web Service" 	<p>See Process Control 3.0 "Rule Script" in "Global Evaluation Setup" where this has been implemented before.</p> <p>Confirmation required:</p> <ol style="list-style-type: none"> The field System name is not relevant. Should this be removed from the UI? <p>At: I would suggest we keep it as it is possible we use the Web Service to connect to non-SAP systems.</p>
2	Select "Create New Script"	<ul style="list-style-type: none"> - Script ID - Script name - Script description - Script type - System connector (s) - Query name - Org parameter type (e.g. cost center, sales center) 		<ul style="list-style-type: none"> - Script ID is a unique ID# that is auto-generated - Script type can be either SAPQuery, BW Query or Web Service - System connector(s) is a drop down with the available SAP systems. It is restricted based on the script type just selected - Query name is a preview of the name of the assigned query. To select this is to generate a popup to browse and select the actual query - Org parameter is a list of applicable parameters. The applicable parameters are those parameters that are maintained for the organization that are allowable inputs for the query selected. To modify is to select from a dropdown of available parameters. - Return value is the column from the SAPQuery or BW Query that will be returned as the value used for the base KPI in question. To select this is choose from a dropdown the relevant column from the SAPQuery or BW Query 	<p>See Risk Management 3.0 "KRI Implementation" under "Risk Monitoring" where all of this has been implemented except for org parameter type and material parameter type.</p> <p>Queries:</p> <ol style="list-style-type: none"> Could you please add the mockup of query popup here? I need to go look for this... Should there be a customization to restrict the SAP queries/BW queries/Web services that would be displayed for the user (like in RM) ? Yes I think that is the best approach. In fact we will want to pre-deliver a number of queries as part of this customizing.
2a	Select & assign query (dropdown)	<ul style="list-style-type: none"> - Return value column - Return value unit - Return value unit type - Aggregation method 		<ul style="list-style-type: none"> - Return value units is the unit of the value returned from the SAPQuery or BW Query. It should be auto-populated based on the return value column selected. Return value units must match the base KPI unit type in order for the script to be assigned to the base KPI in question. - Return value unit type is auto-populated based on return value unit - Aggregation method is a dropdown select of different aggregation options (Arithmetic Average, Number of Values, First Value, Last Value, Maximum, Median, Minimum, Standard Deviation, Sum, Variance) . User must select 1 and only 1 aggregation method. 	
2b	Test connector				See Risk Management 3.0 "KRI Implementation" under "Risk Monitoring"
2c	Test script		See above		See Risk Management 3.0 "KRI Implementation" under "Risk Monitoring"
7	Save and Exit				
Alternative steps					
1	Alternative 1				
2	Alternative 2	Look into OLSP maintenance			
Failures					
1	Failure 1	- Values not returned for requested organizations			
2	Failure 2	- Values not returned for requested materials			

Fig. 3. Example wiki page showing integrated use case and UX mockups

Within the outbound product validation work stream, sprints two through eight included co-innovation partner review of the previous sprint's deliverables, collection of feedback, and incorporation of enhancements into the product backlog. As a tool to engage customers in the per-sprint activities, we used the following illustration.

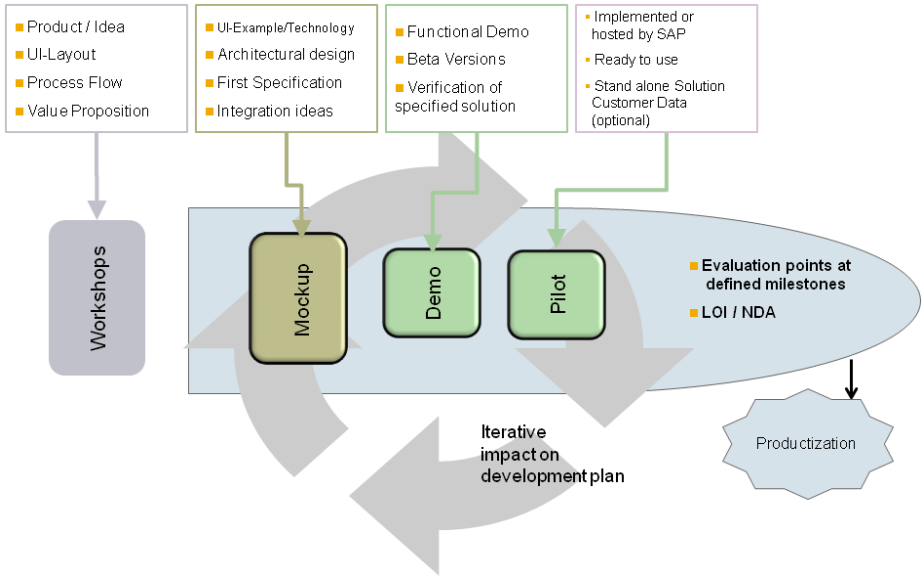


Fig. 4. Iterative customer-focused activities included in co-innovation relationship

Working closely with co-innovation customers throughout development greatly increased the likelihood of customer adoption and veritably ensured a “no-surprises” release. However, coordinating inbound product definition, UX design, development, QA, and outbound product validation activities within short sprints proved to be a sizeable challenge, even with careful planning. An idealized orchestration, defined during the planning phase looked like Fig. 5.

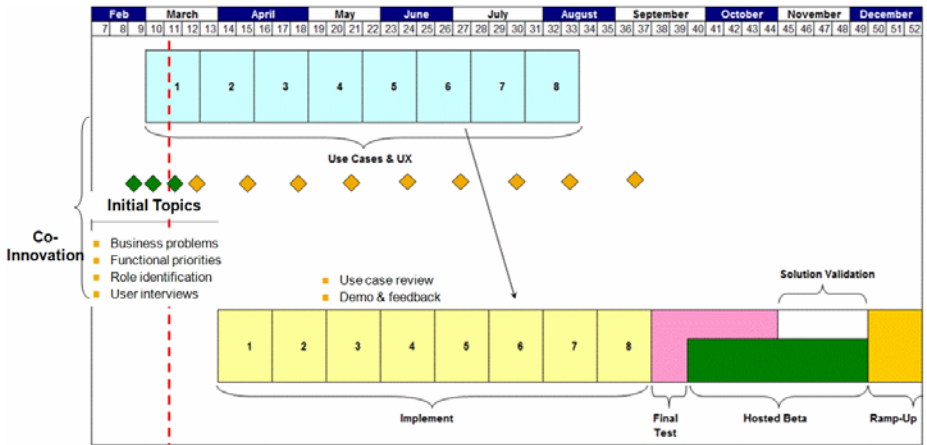


Fig. 5. Draft project plan including UX, co-innovation, development, and testing

In practice, such a plan is rarely as clean as envisioned, and the 1.0 release was no exception. Handoffs from customer to SAP, from Solution Management to UX, and from UX to Development always demanded more energy and commitment than planned, sometimes spilling over well into subsequent sprints. Specific to UX deliverables (wireframes, detailed mockups, interaction flows, etc.), oftentimes ongoing refinements due to technical constraints or fluctuating customer requirements rendered the term “handoff” inappropriate; perhaps “ongoing collaboration” would be a better characterization.

The UX team utilized various techniques to maximize effectiveness and minimize risk in this environment. The most useful and easily transferable to other projects are summarized below:

- Define, refine, and live in an environment of “good enough for now.” While many designers’ inclination is to document and deliver only the final, perfected design, Agile Development prefers the “Just Enough Documentation” (JED) approach to deliverables. For UX, JED might mean delivering very rough wireframes, or even taking pictures of drawings on a whiteboard. It will vary per project—the goal is to be flexible and fast, open to the likelihood that changes will be made in future sprints, anyway. “Good enough for now” is often far more effective than “perfect.” However, there are tradeoffs between detail now and detail later. If too little detail is included in initial deliverables, the latter burden of clarifying ambiguities may become overwhelming, distracting from future sprint’s design deliverables. The goal is to find the right balance between speed now and speed later; sometime trial and error is the only tool available in working toward this goal, as each team and project calls for a slightly different definition of “good enough for now.”
- Manage UX dependencies within the development timeline; beware of designing one piece of the puzzle at a time. Agile projects tend to engender a very piecemeal approach to product design, with business and technical representatives eager to cut up features into little bits, prioritize them, and spread them throughout sprints. UX must beware of the risks of designing one piece of the puzzle at a time—the puzzle may not fit together in the end—and address design tasks holistically, considering antecedent and subsequent user interactions. Sometimes, it’s best to request that items on the product backlog be reordered (reprioritized) in order to align antecedent and subsequent interactions.
- Embrace opportunities for incremental Ux improvements within Agile. Sprint reviews, product backlog reviews, and customer engagement sessions all present opportunities to introduce UX improvements to the product; use them wisely. Consider including a devoted “cleanup” sprint at the end of the release to tie up any loose ends and ensure overall UX quality.

4 Back to the User

Wrapping up the 1.0 release and preparing for the 2.0 cycle, SAP contracted User Centric, an independent usability consulting firm, to conduct a formative usability test. Based upon customer ramp-up feedback, productive customer input, and internal review, four tasks for the Sustainability Analyst role were identified as most likely to

benefit from usability testing These tasks involved some of the more complex business objects and the most sophisticated interactions:

- Task 1 Walkthrough of KPIs
- Task 2a Edit KPI Relationships
- Task 2b Create KPIs from Dialog
- Task 2c Define Formula
- Task 3a Create Core KPI
- Task 3b Define KPI Relationship
- Task 4a Locate Framework
- Task 4b Identify Related KPIs
- Task 4c Add KPI to Framework

Despite the known challenges inherent to the tasks, the report concluded with the assessment: “Overall, test participants viewed the SAP SuPM application favorably.” Yet, task completion rates clearly revealed areas demanding further attention:

Table 2. Task completion rates from the formative usability test

Task 1: Walkthrough of KPIs (n=8)			
	Success	Struggled Success	Failure
Number of Participants	5	2	1
	63%	25%	13%

Task 3b: Define KPI Relationship (n=5)			
	Success	Struggled Success	Failure
Number of Participants	4	1	0
	80%	20%	0%

Task 2a: Edit KPI Relationships (n=8)			
	Success	Struggled Success	Failure
Number of Participants	0	4	4
	0%	50%	50%

Task 4a: Locate Framework (n=6)			
	Success	Struggled Success	Failure
Number of Participants	6	0	0
	100%	0%	0%

Task 2b: Create KPIs from Dialog (n=8)			
	Success	Struggled Success	Failure
Number of Participants	4	4	0
	50%	50%	0%

Task 4b: Identify Related KPIs (n=6)			
	Success	Struggled Success	Failure
Number of Participants	5	0	1
	83%	0%	17%

Task 2c: Define Formula (n=8)			
	Success	Struggled Success	Failure
Number of Participants	0	3	5
	0%	38%	63%

Task 4c: Add KPI to Framework (n=6)			
	Success	Struggled Success	Failure
Number of Participants	2	3	1
	33%	50%	17%

Task 3a: Create Core KPI (n=5)			
	Success	Struggled Success	Failure
Number of Participants	4	1	0
	80%	20%	0%

Based upon the report of findings and a secondary prioritization according to expected business benefit, UX prepared approximately twenty design enhancements that were rolled into 2.0, released to the market in late 2010.

Concluding with feedback from a co-innovation customer, the business value of the product is clear:

“SAP Sustainability Performance Management will enable us to move beyond measuring and reporting to incorporating sustainability in a more strategic way within our business.” – John Gagel, Manager of Sustainable Practices, Lexmark

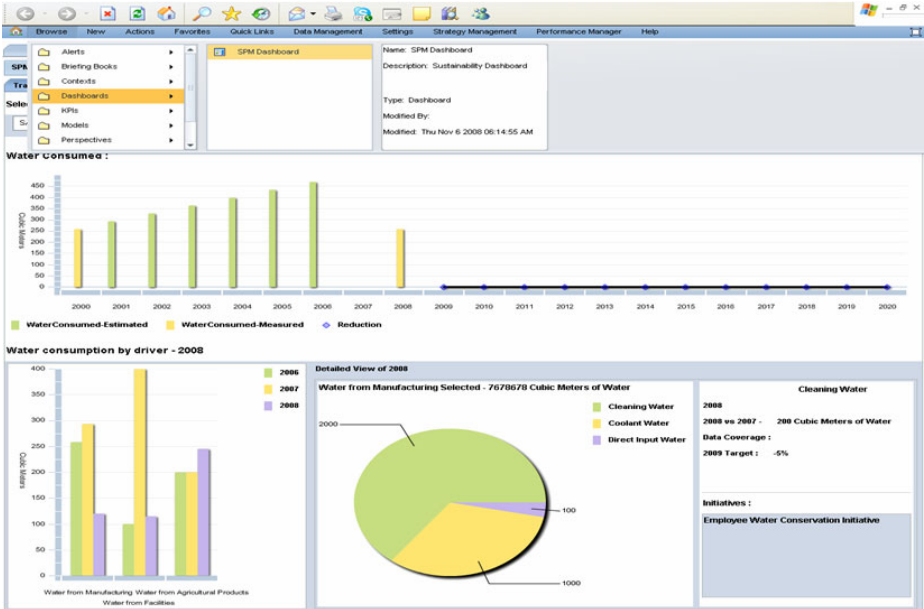


Fig. 6. SAP SuPM example dashboard illustrating historical performance of a water KPI

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