HONEYWELL PROCESS SOLUTION ENTERPRISE ARCHITECTURE PLAN AND STRAREGY

FADI TABET
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CHAPTER I: THE STRATEGIC PLAN

1. Introduction

The Strategic plan is an organizational management activity that is used to set priorities, focus energy and resources, strengthen operations, ensure that employees and other stakeholders are working toward common goals, establish agreement around intended outcomes/results, and assess and adjust the organization's direction in response to a changing environment. It is a disciplined effort that produces fundamental decisions and actions that shape and guide what an organization is, who it serves, what it does, and why it does it, with a focus on the future. Effective strategic planning articulates not only where an organization is going in the next 3 to 5 years and the actions needed to make progress, but also how it will know if it is successful.

"A good strategic plan is a set of directions you want to take. It's a roadmap, lightly filled in, so that it gives you plenty of room to maneuver."

~ Larry Bossidy Former Chairman & CEO of Honeywell International Inc. ~

There are a variety of perspectives, models and approaches used in strategic planning. The way that a strategic plan is developed depends on the nature of the organization's leadership, culture of the organization, complexity of the organization's environment, size and resources of the organization and expertise of planners.

Honeywell Process Solutions has developed and employed an ambitious Five-Year Strategic Plan for 2014 to 2018 focuses on continued innovation, enhanced customer value, robust cash allocation, and a global focus to achieve double-digit earnings growth.

This chapter contains a detailed explanation of Honeywell Process Solutions strategic plan for 2014 to 2018. The following are the strategic plan components and artifacts.

2. Company Overview

Honeywell Process Solutions (HPS) is a one of the four business units of Honeywell International Inc. HPS is a global leader with over 40 years of experience delivering process automation, control solutions and advanced software's and integrated technologies that help industrial customers run their operations safely, reliably, efficiently and sustainably through innovative technologies, services and domain expertise. With more than 22,000 employees around the world, HPS serves customers in more than 125 countries and has the global expertise and breadth of resources to execute projects of every size and complexity in the oil and gas, refining, pulp and paper, industrial power generation, chemicals and petrochemicals, biofuels, life sciences, and metals, minerals and mining industries.

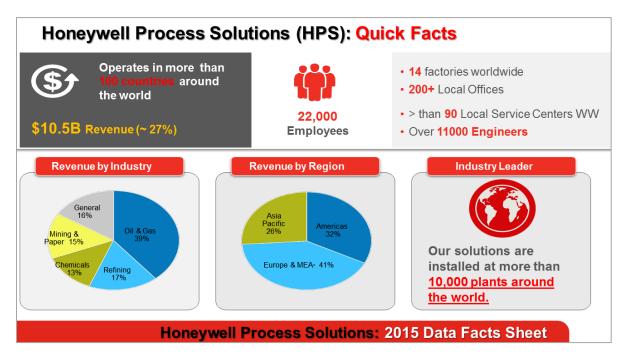


Figure 1: HPS Facts Sheet 2015

Comprehensive solutions offered by HPS:

- Technology development and licensing
- Process automation and optimization
- Industry depth and application expertise
- Energy-efficient materials and high-purity metals and chemicals
- Lean execution of projects and services reduce time, money and risk
- Remote analytics and field support
- Innovative technology for process optimization and operational excellence

3. Mission Statement

"Create value for shareholders through control technology that saves energy, protects the environment, improves productivity, increases connectivity and safety, and promotes peace."

Honeywell's innovative technologies are making our world cleaner and more sustainable, more secure, connected, energy efficient, and productive. By focusing on the following:

- **1. People:** HPS people are its greatest assets. They recognize themselves as a global team of individuals. They take greatest pride in working among the best in the business, learning from each other and delivering as a team.
- **2. Integrity:** When challenged with tough business decisions, HPS does not tolerate anything but the highest levels of integrity, not only for themselves but for all those around them.
- **3. Global Operations:** HPS people are all part of a global company that operates in more than 100 countries, respecting diversity, but sharing common values and vision.
- **4. Customer-Centric Management:** Is a way of doing business in a way that provides a positive customer experience before and after the sale in order to drive repeat business, customer loyalty and profits. Because HPS is more than a company that offers good services and products.

4. Vision Statement

"To continuously improve the way we do things so that we can capture greater value not just for us, but also for our customers."

Honeywell Process Solutions (HPS) is committed to help industrial customers around the world operate safe, reliable, efficient, sustainable and more profitable facilities by offering leading technologies from the plant floor to the control room as well as comprehensive lifecycle services that help to ensure more productive and stable operations around the entire facility. As well as maintaining an effective customer managed relationships.

5. Strategic Direction

The next step in strategic planning is identifying the overall strategic directions that will guide the plan and focus our actions to achieve our mission, vision and goals.



Figure 2: HPS Strategic Direction Plan Components

Honeywell Process Solutions strategic direction plan consists of the following:

- **1. More Cash Deployment:** HPS strong balance sheet and free cash flow provide flexibility to reinvest inside the unit itself and support Honeywell global acquisition strategy. (Honeywell spent \$12B since 2002 in 19+ acquisitions for companies in different technological field).
- **2. Expanding into Emerging Markets:** HPS has gradually changed its sales profile over the last decade with more investments in the emerging markets like BRICS Countries and Gulf Countries which help the unit expand globally and boost revenue (from 11% in 2003 to 27% in 2015) so now the unit plans to reinvest by 2018 around \$3B in these markets to get more exposure and revenue.
- **3. Human Capital:** In 2016 HPS became the first subdivision in all large western companies to announce that it is 100% compatible with Capability Maturity Model Integration (CMMI®) Maturity Level 5 across all global

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operations. Where CMMI is a set of standards methods and best practices highly predictable, and optimized to achieve efficiencies through software innovation. HPS will continue to support its employees to enrich their skills and knowledge.

- **4. Intensified Software Focus:** HPS strong industrial heritage gives it the unique ability to blend physical products with software to make its solutions more connected, efficient and productive. Currently the Unit is developing solutions including new applications for the Industrial *Internet of Things*, advanced software services for smart and connected plants to help them switch to *Industry 4.0* and provide them with accurate and high quality *Actionable Analytics*.
- **5. High Revenue:** with \$10.5 B in revenue as of 2015 HPS will continue to diversify its production line, Review its pricing strategy, expand its distribution, increase marketing and develop customer relationships.
- **6. Market Leadership:** HPS will continue focusing on maintaining its market leadership in the industrial market by keep working and improving the quality and performance of its products and services.

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6. S.W.O.T Analysis

HPS consistently performs SWOT Analysis to assess the positive and negative forces within and without the organization, so they can be better prepared to act effectively. SWOT is also used to identify the issues or problems they intend to change, Set or reaffirm goals, create an action plan and to capture any new opportunities.

The latest S.W.O.T analysis result are shown in the below figure (Figure 3)

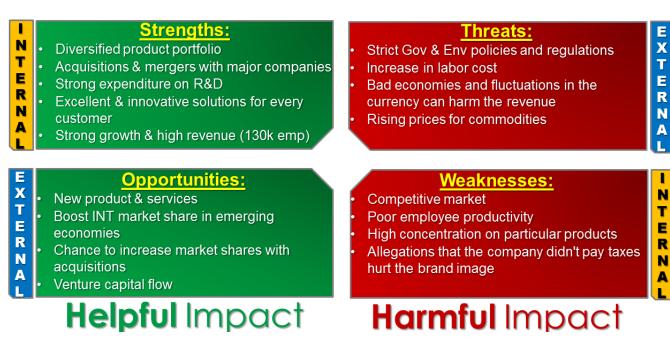


Figure 3: HPS SWOT Analysis 2015

The results of the above analysis provide clues to help the organization:

- Undertake actions to protect/improve the firm's strengths.
- Initiate efforts to overcome and reduce the weaknesses
- Pursue market opportunities matched with resource capabilities
- Take actions to defend against external threats

7. CONOPS

Concept of operation is a basic step in determining the product effectiveness from the stakeholder point of view that's why HPS develops a detailed CONOPS for all of its products and services and test them against several scenarios to determine their abilities to achieve their objectives and what are the steps followed to get there.

Below (Figure 4) is the CONOPS of "Honeywell Symphonite" a Software for Advanced Control, Optimization and Monitoring.

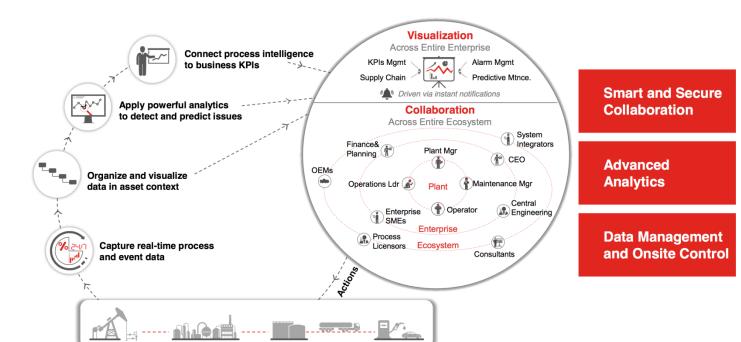


Figure 4: 'Symphonite' Software CONOPS

Objective: The Objective of "Honeywell Symphonite" is to help factories efficiently operate their production and supply chain by easily connecting supply to demand to achieve business agility.

Stakeholders: Industrial factories (Chemical, Oil, Power Plants, etc...).

User can use "Symphonite" to get real time information or historical data about any phase of production and supply chain and its status. In addition to the ability of changing the rules that govern how this phase is operating.

8. General Competitive Strategy

To maintain and improve its position in the market and increase its revenue, HPS follows a general competitive strategy that helps the company to highly and effectively compete against other companies in the industry and achieve better results.

The general competitive strategy followed by HPS is a blend of 4 main components:



- 1. Cost Leadership: Here the main focus centers on automating manufacturing processes and work procedures in order to streamline operations and reduce cost. HPS has successfully applied this phase on some of its products especially hardware physical devices (ex: industrial control sensors).
- 2. **Product Leadership:** The aims to build a company that continuously brings superior products to market. HPS has successfully applied this strategy multiple times in the past when they release the first Industrial Internet of Things Interconnected System known as "Honeywell Industrial Internet of Things H-IIOT", and The Virtual Control and Operation Room known as "Experion PKS" which is still considered a unique product in its category until today.
- **3. Market Focus:** This component shifts the focus of the company from targeting customers across the entire industry to a specific segment inside the industry. This strategy was applied successfully by HPS in targeting specific geographical markets like BRICS and Gulf countries where most petrochemical industries are run by HPS Systems and Software's.

4. Customer Intimacy: The customer intimacy strategy focuses on offering a unique range of customer services that allows for the personalization of service and the customization of products to meet different customer needs. HPS already developed several software and sensors to meet custom needs such as "Blending Movement Automation System developed for Exxon Mobil Chemical Refinery in China in 2014".

Another component used by HPS and not included in the above strategy is acquiring other competitors where the unit recently in the second quarter of 2016 acquired the following competitors companies: "Elster, Xtralis, Intelligrated, and Movilizer".

All the above components form the general competitive strategy followed by HPS to keep advantage over its competitors.

9. Strategic Goals

Strategic goals are one of the most critical and important aspects in a strategic plan, that's why HPS reviews and updates its strategic goals and objectives constantly to keep them in line with its competitive strategy and therefore the entire strategic plan. HPS uses other parts in the strategic plan including SWOT analysis to help the unit develops achievable goals that reflects the business realities and the company vision and mission. HPS prioritize its strategic goals in a systematic way by taking into consideration too many factors like feasibility, risks, ease of implementation, market effectiveness and attractiveness, budget forecasting and timeline issues. (See figure 6).

No	Strategic Goals	Executive Sponsor
1	Lowest Cost of Operation	VP Automation, Mr. David Bieda
2	High Productivity	VP Automation, Mr. David Bieda
3	Increase Market Share	VP Admin, Mr.Paul Gibson
4	Maintain High Revenue & Growth	VP Finance, Mr. Steven Cohen
5	New and Superior Product Development	CIO, Mr. Tom Bush
6	Increase Product Competitiveness	VP DevelOps, Mr. Heather Lister
7	Increase Employees Knowledge and Skills	VP Admin, Mr.Paul Gibson
8	Better Customer Relationship and Loyalty	VP Marketing, Mrs.Jean Sears
9	Increase Customer Satisfaction and Referral	VP Cust Rel, Mr.Steve Para

Figure 6: HPS Strategic Goals

10. Strategic Initiatives

Strategic initiatives are the means through which an organization translates its strategic goals into practice. To stay ahead of the competition, HPS systematically build a portfolio of strategic initiatives. Such initiatives are typically aligned with the company's top strategic priorities.

HPS strategic initiatives are aligned with their goals as follows: (goal/initiative) Some initiative are common between multiple goals (please see figure 7 for more details)

- **1.** <u>Lowest Cost of Operation:</u> Find ways to restructure value chain to eliminate nonessential work steps and low-value activities.
- 2. <u>High Productivity:</u> Process, Technology and Management Simplification.
- **3.** <u>Increase Market Share:</u> Acquire new startups and companies entering your market.
- **4.** <u>Maintain High Revenue & Growth</u>: Offer tailored basic products and services to a specific market or group of people in a low price.
- **5.** New and Superior Product Development: Identify new customer needs and wants.
- **6.** <u>Increase Product Competitiveness:</u> Cross functional product project teams (product and brand managers are the key position to innovative products).
- 7. <u>Increase Employees Knowledge and Skills:</u> provide employees with professional training to enhance and develop new skills.
- **8.** <u>Better Customer Relationship and Loyalty</u>: Teach customer to use your product or service better (ex: onsite training).
- **9.** <u>Increase Customer Satisfaction and Referral:</u> Provide quick and effective support to solve customer problems in a professional manner

11. Outcome Measures

Outcome measure is the level of performance or achievement that occurred because of the activity or services the organization provided. Outcome measures are a more appropriate indicator of effectiveness. Outcomes quantify performance and assess the success of the process.

HPS performs outcome measures to document the contribution of its initiative toward achieving its strategic goals. Performance outcome measures also help to maximize the impact of dollars spent on products, services and programs. In addition to outcome measure HPS performs other type of measures like indicator, output and performance measures. The following table (Figure 7) summarizes the result of the outcome measure taking into consideration the competitive strategy component, initiative and its goal.

No#	Strategy		Performance	Goals	
#1	Cost Leadership	Find ways to restructure value chain to eliminate nonessential work steps and low-value activities	Reduce production cost between 5% to 8% per year	Operational Excellence (Lowest Cost of Operation)	
	Product		Introduce at least 2 to 3 new	New Product Development	
#2	Leadership	Identify new customer needs and wants	products each year	Increase Market Share	
#1	Cost Leadership	Process, Technology and Management Simplification	Increase employees productivity almost by 15% per year	Operation Excellence (High Productivity)	
	Market	Offer tailored basic products and services to	Increase Regional/Local Sales	Maintain High Revenue & Growth	
#3	Focus	a specific market or group of people in a low price	by 20% each year	Increase Market Share	
	Customer	Teach customer to use your product or	Reduce Customer Turnover by	Better Customer Relationship	
#4	Intimacy	service better (ex: onsite training)	10% each year	Increased Loyalty	
	Product	Cross functional product project teams	Increase Sales by 3% to 5%	Maintain High Revenue & Growth	
#2	Leadership	(product and brand managers are the key position)	yearly	ncrease Product Competitiveness	
#4	Customer Intimacy			Increase Customer Satisfaction and Referral	
	Market	Acquire new startups and companies	Maintain #1 Market Share in	Maintain High Revenue & Growth	
#3	Focus	entering your market	Gulf Countries since 2008	Increase Market Share	

Figure 7: HPS Initiative to Performance Measure to Strategic Component and Goal Mapping

CHAPTER II: PORTFOLIO OF PROJECTS

This chapter is dedicated to give detailed information about Honeywell Process Solutions selections criteria and display the report generated by "Velero PPM" for each of those reports.

1. Defining Selection Criteria

Selecting the right project is a critical component that will shape the company future up or down based on that decision. That's why defining a clear and strong selection criteria would help decision makers and therefore their companies avoid selecting an unsuccessful project.

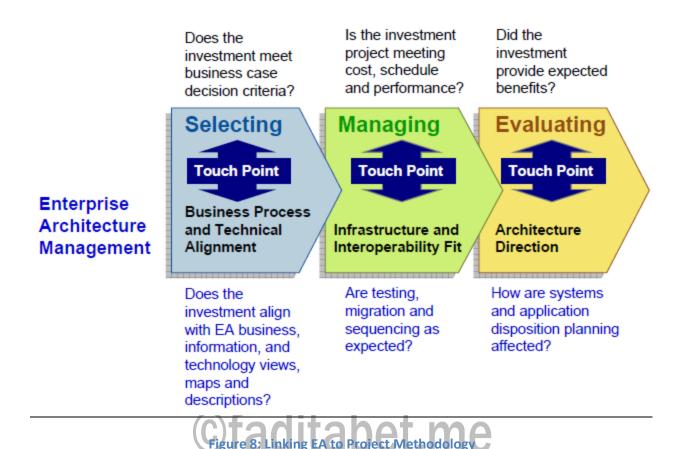
Honeywell Process Solutions (HPS) is one of those companies that have built its own selection criteria matrix that fits its own business environment and achieve the company strategic plan.

One of the backbones of the selection criteria is HPS Enterprise Architecture which defines the company structure and operations currently and in the future.

HPS selection criteria are largely based on project alliance with the company EA and its components. In addition, HPS takes other factors like financial constraints, Return Over Investment (ROI), political and social situations where the project will be implemented and many other factors.

The Main Key Issues from EA Point of View that the project/product must adhere to are:

- A. Linking EA to project methodology.
- B. Capturing EA-centric project success stories
- A. <u>Linking EA to project methodology:</u> investment choices should be evaluated throughout their life cycles using critical questions drawn from portfolio management and EA assessment approaches.(see figure 8)



The highest level of EA to project links should be defined at the portfolio or enterprise program management (EPM) level. EA should be supplying information to help judge all projects simultaneously, at the portfolio level, rather than only one project at a time.

At every phase in the selection process EA input and assessment are essential. In the selection criteria for any investments, business, performance and technical reference models can be used to assess alignment with business and technical strategies, goals and objectives. As specific projects go through their life cycles and are evaluated regularly for cost, schedule and performance progress, testing for architecture fit, sequencing impact and project interdependencies can be included. Finally, in post-investment reviews used in comprehensive portfolio management approaches, actual project outcomes can be used to determine potential technical work and changes affecting the desired targeted business and technical architectures (redevelopment, re-engineering, earlier phase-out and so on). Any area of the EA framework can provide context for assessments either of single projects or whole portfolios. Most organizations start with the technology architecture links, as the examples here do, but the greater value may be in leveraging the business and information architecture as well as the EA requirements and principles that assure greater business alignment. As any individual project does a business case, this EA content can be leveraged.

B. <u>Defining EA models that are easy to use in projects:</u> It is important to define an EA services model that includes creation, compliance, consulting, and communication and research functions. Once you have the model defines the link between the proposed project and your model. (see figure 9).

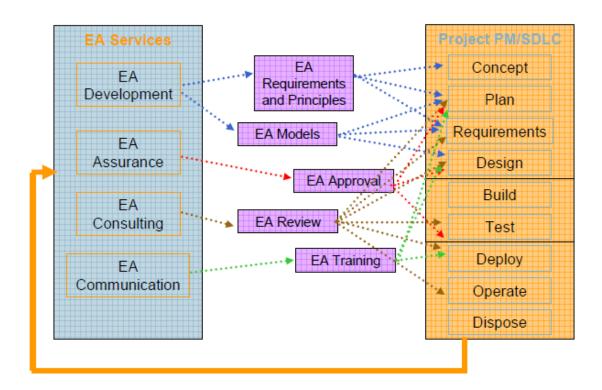


Figure 9: Define & Link EA Services for Projects

- Provide automated, pattern-matching function online to ask a few questions to determine the right starter pattern (or pattern set)
- Link to other project documentation that has done similar things (for deeper content)
- Formatting all project documentation similarly makes for easier EA assurance review
- Matching the project documentation and EA standards models makes project leverage easier

HPS selection criteria also takes into consideration project alignment with critical factors that some of them are common with EA components such as:

1. Consistency of the project objectives:

The objectives of the project must be consistent with AGFUND's objectives and its

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development areas in terms of identifying the target groups and their aim to meet their needs.

2. Sustainability of the project:

The project must aim to achieve sustainable human development and continuity of benefit for the beneficiary groups.

3. Appropriate timeline:

The timeline required for the implementation of the project must be appropriate and compatible with the elements and activities included in the project.

4. Reasonable costs and feasible contributions:

The cost of the proposed project must be reasonable and commensurate with similar projects in terms of nature and size.

5. Project sponsorship:

The level of project sponsorship is often the difference between project success and failure. Strong sponsorship at an appropriately high level cannot be underestimated.



2. Velero PPM Reports

 ${f B}$ ased on the selection criteria defined in the previous section the below are the three projects that meet HPS selection criteria.

1. DynAMo Alarm and Operations Management Software

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Project* Status Report: [849] DynAMo Alarm and Operations Management Software

Client*	Client* Sponsor		Sponsor Program*			C	Category[A]*	В	usin	ess Driver*	Priority Rai	
Honeywell	Department, Ad	min	N	NEU - Enterprise Ard	chitecture		(none	e)	Busii	ness	Driver?	1
Project Mgr*	Proj Heatmap	Pre: Heatn		Date Last Updated	Project* §		Es	st. Completion Date	Та		Deployment Date	Project* Sta
Tabet, Fadi	Yellow	Yello	ow	04/28/2017	03/01/20)17		05/03/2017		04/	29/2017	Approved
MPAC	: т											
Enhancer	ment to the existing Bus/Ops?	ng	Υ	Current Pro		Y		Service Improvement	t?	Υ		
F	Regulatory?		Υ	Enterprise F	Priority?	Υ		Strategic Initiat	ive?	Υ	Available Funding	650,000.
Cost of	NOT Implementin	g 4	150,000.00	Total Expecte	ed Saving	500,000	.00	Cost Saving	?	Υ	Saving Years	
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2. Honeywell PULSE - Mobile App for Real-Time Plant Notification

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Project* Status Report: [850] Honeywell Pulse - Mobile App for Real-Time Plant Notifications

Project* Information

Client*	Sponsor		Prog	ram*	Category[A]*	Business Driver*	Priority Rank
Honeywell	Department, Ad	dmin	NEU - Enterprise Architecture (r		(none)	Business Driver?	2
Project Mgr*	Proj Heatmap	Prev Heatmap	Date Last Updated	Project* Start Date	Est. Completion Date	Target Deployment Date	Project* Status
Tabet, Fadi	Green	Green	04/28/2017	04/30/2017	06/02/2017	04/29/2017	Approved

IMPACT							
Enhancement to the existing Pus/Ops? Current Process Puprovement? Service Improvement?							
Regulatory?	N	Enterprise Priority?	Y	Strategic Initiative?	Υ	Available Funding	550,000.00
Cost of NOT Implementing	300,000.00	Total Expected Saving	175,000.00	Cost Saving?	Υ	Saving Years	1

STATUS REPORT

PLANNING MANDATE DESCRIPTION

The purpose of "Honeywell Pulse" is to tackle loss of situational awareness in an industrial enterprise and provides tools and connectivity to assess and respond quickly and efficiently to these situations.

2. AUTHORITY RESPONSIBLE "Honeywell Process Solutions Unit.

3. BACKGROUND
One of the greatest risks a factory management have when faced with a problem is that the factory management are simply not aware a problem exists. "Honeywell Pulse" is a mobile

application that notifies you in real time of a plant condition(s) that requires your attention/action and suggests a list of solution(s) based on data provided from all other "Honeywell" sensors and resources found in your factory.

- 4. PROJECT OBJECTIVES
- Increase awareness of situation(s) by receiving real time alert(s) on critical event(s) that is happening in the factory.
 Understanding an event details by using advanced trending features and/or comparing with

- 3. Enabling true collaboration by starting advanced containing estates a state of companing with historical data for better understanding of the situation.

 3. Enabling true collaboration by sharing the event in a threaded conversation that brings forward comments/solutions from situation stakeholder on site.

 4. Monitor plant performance and safety at anytime, from anywhere.

- I. Deliverables:
- 1. A Mobile application that can run on most mobile operating systems like (Android, iOS and Windows Phone).
- An easy GUI that
 will help user check and assess data in real time.
 An eighty interactive and efficient data trending capabilities.
- A. The product should exchange data and information only with particular products and softwares developed by "Honeywell International Inc".

 B. The product must work as a part/node within the full "Honeywell Process Solution Network" operated in the plant.
- 7. INTERFACES

The project team should communicate and exchange information with other teams in "Honeywell Process Solutions Unit" whom are working on the following projects:

A. Honeywell Pulse (HPulse) ==> http://bit.do/HPulse

- B. Experion® Process Knowledge System (PKS) ==> http://bit.do/HPExperionPKS C. Process Safety Analyzer (PSA) ==> http://bit.do/HW-PSA

8. QUALITY EXPECTATIONS
A user can subscribe/unsubscribe to alerts that are only interested and critical for him/her and the application will send the alert as

the event is happening while fetching and analyzing all the data related to that event in real time so the user will be able to made a decision and/or collaborate the event with other users and maybe solve the problem in a couple of minutes.

9. OUTLINE BUSINESS CASE

Increasing situational awareness in the manufacturing organization will lead to increase in safety and productivity while decreasing the cost and time used.

10. ASSOCIATED DOCUMENTS Documentation and Requirement

can be found: http://bit.do/HW-PulseDocReq

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3. Symphonite - Software for Supply Chain and Production **Management**

Only the first page of Velero PPM Reports is displayed

Project* Status Report: [847] Symphonite - Software for Supply Chain and Production Management

Project* Information Client* Sponsor Program* Category[A]* Business Driver* **Priority Rank** NEU - Enterprise Architecture Business Driver? Honeywell Department, Admin Prev Date Last Updated Project* Start Date Est. Completion Date Target Deployment Date Project* Status Tabet, Fadi 04/28/2017 02/02/2017 06/28/2017 05/17/2017 Approved IMPACT Enhancement to the existing Current Process Service Bus/Ops? Improvement? Available Funding Enterprise Priority? 300 000 00 Regulatory? Strategic Initiative? Cost of NOT Implementing 90.000.00 Total Expected Saving 0.00 Cost Saving? Saving Years STATUS REPORT PLANNING MANDATE DESCRIPTION 1 PURPOSE 1.1 of Cold of "Honeywell Symphonite" is to help factories efficiently operate their production and supply chain by easily connecting supply to demand to achieve business agility. 2. AUTHORITY RESPONSIBLE HPS Unit Director "John Harold" and Project Manager "Carl Satriani". 3. BACKGROUND 5. BACKGROOMS. One of the complex and distributed production and supply chain is challenging. "Symphonite" is a supply chain and production management software that connects all phases of SCPM together in multiple locations and across time and functions to ensure achieving high Reliability, Responsiveness and Agility. 4. PROJECT OBJECTIVES Increase reliability and on time delivery. High responsiveness by reducing production time cycles. Minimizing impact of unplanned events and capture opportunities. Reduction in energy use and loss Inventory carrying costs. Increase revenue from product mix optimization. SCOPE Deliverables: An enterprise computer software application that can run on different machines. A centric data storage. A billity to communicate with different devices in multiple locations at the same time. A highly interactive and efficient data trending capabilities. 6. CONSTRAINTS A. The product should exchange data and information only with organization authorized software's and other "Honeywell Inc" Soliwards B. The product must work as a part/node within the full "Honeywell Process Solution Network" operated in the plant OR as an independent software that can get input manually through its interface. The project team should communicate and exchange information with other teams in "Honeywell Process Solutions Unit" whom are working on the following projects: A. Intuition – Software for Enterprise Collaboration ==> http://bit.do/HPIntuition B. Profit – Software for Advanced Control, Optimization and Monitoring ==> http://bit.do/HPProfit 8. QUALITY EXPECTATIONS User can use "Symphonite" to get real time information or historical data about any phase of production and supply chain and its status. In addition to the ability of changing the rules that govern how this phase is operating. 9 OUTLINE BUSINESS CASE Smoothly connecting all phases of production and supply chain will reduce operation cost, time and risk. It will also increase effectiveness, productivity and profit across the entire organization. 10. ASSOCIATED DOCUMENTS Documentation and Requirements can be found: http://bit.do/HPSymphoniteDocReq

MILESTONES/TASKS

Velero Technology - vPPM April 28, 2017 Page 1 of 6

CHAPTER III: EA MANAGEMENT PLAN

A. ENTERPRISE PROGRAM MANAGEMENT PLAN

1. Introduction: EA & EAM

The primary need for developing enterprise architecture (EA) is to have a clear picture of the organization and learn how it works from the business to IT and how business visions and strategy can be met. EA helps to enable the alignment of organizational structures, processes and technology to help business services get delivered at less cost, higher quality and higher speed. Enterprise architecture helps steer business in the right direction, prepare to deal with disruptive business and IT change, and invest in the right projects.

Honeywell Process Solutions (HPS) understands the importance of establishing and enforcing the Enterprise Architecture Management Program (EAM) which is a collection of management practice and guidelines that provide direction and practical help in the design and development of the enterprise architecture (EA) to reach its vision and strategy.

In this section of this chapter HPS EA Program Management components are discussed in details.

2. Governance & Principle

Governance and principles document the way that policy and decision making will occur within the Enterprise Architecture (EA) program. This is also where the underlying principles of the EA program are articulated.

The Chief Architect is the principle Program Manager for the HPS EAM program and will direct the program under the strategic guidance of HPS executive managers.

- The EAM program will be implemented using a blend of TOGAF and Zachman Frameworks.
- Emphasis will be placed on the alignment of the HPS enterprise with strategic goals. Specifically emphasizing the concept of: Enterprise Architecture = Strategy + Business + Technology
- The EAM will reflect the following principles:
 - i. Information sharing
 - ii. Stake holder participation
 - iii. The use commercial products that are based on open standards
 - iv. The recognition that Information Technology (IT) is a means and not an end
- The recognition that EA adds value to planning, decision making and communication.

The Characteristics of 'Corporate' Governance applied by HPS are summarized in the below graph (Figure 10)

Discipline

Commit to adhere to all process, procedures, etc.

Transparency

All actions and related materials are visible and available for review and inspection

Independence

Ways to avoid any conflict and / or disagreements on interests [interest collision].

Accountability

Everyone who perform the tasks are accountable.

Responsibility

Everyone must act responsibly while performing tasks.

Fairness

All teams and groups are equal with one another. No advantage.

Figure 10: HPS Corporate Governance Characteristics

And because TOGAF focused more on <u>Architecture Governance</u> which support other forms of governance (IT Governance, Technology Governance, Corporate Governance....). HPS strictly comply with Architecture Governance principles to help them reach their goals and mission and simplify their work. (see figure 11 for more details).

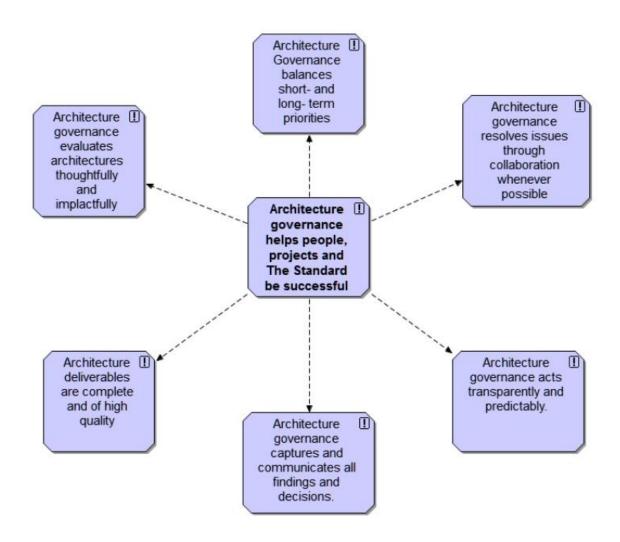


Figure 11: HPS Architecture Governance Principles (TOGAF)

3. Support for Strategy and Business

One of the main purposes for the EAM program is to support and improve HPS enterprise's strategic and business planning processes, as well as to identify performance gaps that EA components can help close. This is done by:

- Cost Leadership
- Product Leadership
- Market Focus
- Customer Intimacy
- Competitor Acquisitions

It is important to show the linkage of the EAM program to the accomplishments of the enterprise's strategic goals, and to clearly show how EA components support the lines of business activities. The below graph (figure 12) shows the Competitive Strategic Component on left side and it's End Goals on the right side.



Figure 12: HPS Mapping Competitive Strategy to its Strategic Goals

4. EA Program Roles & Responsibilities

A listing of HPS's EAM plan development stakeholders, their roles, and responsibilities can be found in the below table (see figure 13).

EA Team Position	EA Team Role	Responsibilities
Sponsor HPS CEO		Provide resources. Assist in resolving high-level EA issues
Mr. Vimal Kapur		
Chief Information Officer (CIO)	Decision-Making	Facilitate the establishment and ongoing operation of the
Mr. Peter Rossiter		EA Program. Lead the resolution of high-level EA issues. Integrate EA and other IT governance processes.
Chief Architect	Program Management	Manage the EA program and
Mr. Robert Osborn		documentation process. Select and implement the EA
Vice Chief Architect		framework and
Mr. Heather Lister		documentation methodology. Identify EA standards and
VP Administration		manage EA configuration
Mr. Paul Gibson		management sub-process.
Line of Business	Requirements Identification	
Managers		decision-making. Promote
Commercial Automation		the identification of IT-
Lead		related requirements.
Mr. David Bieda		
Software Development Lead		
Mr. Tom Bush		
Lifecycle Solutions &		
Services		
Mr. John Rudolph		
Research and Development Ms. Vikas Chadha		
Finance and Administration		
Mr. Steven Cohen		
Technology Support Mr. Richard Cori		
Contracts and Legal		
Mrs. Jessica Amartiz		
Marketing & Advertising		
Mrs. Jean Sears		

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Solutions Architect Mr. David Matten Ms. Dona Rapporta	Problem Solving	Collaboratively identify solutions for IT-related problems. Support EA documentation.
Systems Architect Mr. Aonghus Keegan	Analysis and Design	Provide technical analysis and design support for systems-related EA component selection and implementation. Ensure that IT systems meet integration and interoperability requirements. Support EA documentation.
Data Architect Dr. Segun Odion Mr. Marwan Phares	Analysis and Design	Provide technical analysis and design support for database-related EA component selection and implementation. Ensure that databases meet integration and interoperability requirements. Support EA documentation.
EA Tool Expert Mr. Ed Cartagena	Application and Database Support	Maintenance of EA Software Application. Maintenance of EA repository and information.
End-User Representatives Mr. Philip Sears Jr Mr. James Thomson	Requirements Identification / QA	Identify end-user requirements for EA components. Provide feedback on the effectiveness of solutions.
Research Analyst Ms. Andrea Alvaro Mrs. Jean McClain	Requirements Analysis	Document and verify end- user requirements. Assist in EA component design and documentation activities

Figure 13: HPS EA Program Roles and Responsibilities

5. EA Program Budget

Honeywell International Inc recent budget released in 2016 for financial year 2015 can be found on <u>this link</u>. Honeywell Process Solution (HPS) budget is not disclosed to public but a summary of its budget can be found in figure 14

HONEYWELL INTERNATIONAL INC.

This selected financial data should be read in conjunction with Honeywell's Consolidated Financial Statements and related Notes included elsewhere in this Annual Report as well as the section of this Annual Report titled Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

Item 6. Selected Financial Data

		Years E	Ended Decen	nber 31,	
	2015	2014	2013	2012	2011
	(Dolla	ars in millior	ns, except pe	er share amo	unts)
Results of Operations					
Net sales	\$38,581	\$40,306	\$39,055	\$37,665	\$36,529
Amounts attributable to Honeywell:					
Income from continuing operations less net income attributable to the noncontrolling					
interest	4,768	4.239	3.924	2,926	1,858
Income from discontinued operations(1)	_	_	_	_	209
Net income attributable to Honeywell	4,768	4.239	3,924	2,926	2,067
The moone dimediable to honeywen	4,700	4,200	0,024	2,020	2,007
Earnings Per Common Share					
Basic:					
Income from continuing operations	6.11	5.40	4.99	3.74	2.38
Income from discontinued operations					0.27
Net income attributable to Honeywell	6.11	5.40	4.99	3.74	2.65
Assuming dilution:					
Income from continuing operations	6.04	5.33	4.92	3.69	2.35
Income from discontinued operations					0.26
Net income attributable to Honeywell	6.04	5.33	4.92	3.69	2.61
Dividends per share	2.15	1.87	1.68	1.53	1.37
Financial Position at Year-End					
Property, plant and equipment-net	5,789	5.383	5,278	5.001	4.804
Total assets	49,316	45,451	45,435	41,853	39,808
Short-term debt	6,514	2,637	2,028	1,101	674
Long-term debt	5,554	6,046	6,801	6,395	6,881
Total debt	12,068	8,683	8,829	7,496	7,555
Redeemable noncontrolling interest	290	219	167	150	_
Shareowners' equity	18,418	17,784	17,579	13,065	10,902

⁽¹⁾ For the year ended December 31, 2011, income from discontinued operations included a \$178 million, net of tax gain, resulting from the sale of the Consumer Products Group business.

Figure 14: Honeywell International Inc Budget

To See Honeywell International Inc Complete Budget CLICK HERE

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The following is the sales figure of Honeywell Process Solution for year 2015. Because the detailed budget of the unit is not disclosed.

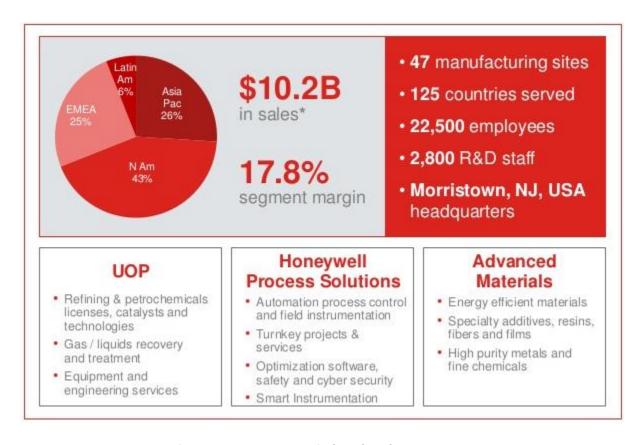


Figure 15: HPS Recent Disclosed Budget 2014

6. EA Program Performance Measures

HPS performance measures document how the effectiveness and efficiency of the EA program will be measured. Outcome measures identify progress being made toward some new end-state. Output measures provide data on activities and things. The performance of the HPS EAM program will be measured using the Balanced Scorecard method in which:

• Outcome Measure is Qualitative (reaching an end state ex: Initiative)

• Output Measure is Quantitative

HPS EA Outcome and Output measures are summarized in the below figure (see figure 16).

Please notice these numbers that are generated as an output are estimation and do not reflect the accurate values.

No#	Competitive	Initiatives	Performance	Goals	EST ~ Total Million Dollar
#1	Strategy Cost Leadership	Find ways to restructure value chain to eliminate nonessential work steps and low-value activities	Reduce production cost between 5% to 8% per year	Operational Excellence (Lowest Cost of Operation)	\$625.50
#2	Product Leadership	Identify new customer needs and wants		New Product Development Increase Market Share	\$789.00
#1	Cost Leadership	Process, Technology and Management Simplification	Increase employees productivity almost by 15% per year	Operation Excellence (High Productivity)	\$891.00
#3	Market Focus	a specific market or group of people in a low		Maintain High Revenue & Growth Increase Market Share	\$320.00
#4	Customer Intimacy	reactificationics to use your product of the duce customer furnover by		Better Customer Relationship Increased Loyalty	\$102.00
#2	Product Leadership	Cross functional product project teams (product and brand managers are the key position)	Increase Sales by 3% to 5% yearly	Maintain High Revenue & Growth ncrease Product Competitiveness	\$354.00
#4	Customer Intimacy	Provide quick and effective support to solve customer problems in a professional manner	Increase customer base between 5% to 8% yearly	Increase Customer Satisfaction and Referral	\$176.00
#3	Market Focus	Acquire new startups and companies entering your market	Maintain #1 Market Share in Gulf Countries since 2008	Maintain High Revenue & Growth Increase Market Share	\$541.00

Figure 16: HPS Estimated Output Based On Outcome of Performance Measure for each Initiative

B. CURRENT ARCHITECTURE SUMMARY

1. Strategic Goals and Initiatives

Strategic goals and initiatives identify how the EA program and specific EA components support the attainment of the enterprise's strategic level goals. The below table map both strategic goals and strategic initiatives to the related strategic EA components. (see figure 17).

Strategic Goals	Strategic Initiatives	Strategic EA Components
Operational Excellence (Lowest Cost of Operation)	Find ways to restructure value chain to eliminate nonessential work steps and low-value activities	New Sales & Customer Portal
New Product Development	Identify new customer needs and	Sales Database, Inventory
Increase Market Share	wants	Management System, Warehouse Management System
Operation Excellence (High Productivity)	Process, Technology and Management Simplification	Capacity Planning and Control System, ERP System
Maintain High Revenue & Growth	Offer tailored basic products and	Sales Database, Inventory
Increase Market Share	services to a specific market or group of people in a low price	Management System, Warehouse Management System
Better Customer Relationship	Teach customer to use your product	Employee Opinion Surveys
Increased Loyalty	or service better (ex: onsite training)	Database
Maintain High Revenue & Growth	Cross functional product project	Lean Manufacturing Accelerated
Increase Product Competitiveness	teams (product and brand managers are the key position)	Improvement Workshops, Supply Chain Management System
Increase Customer Satisfaction and Referral	Provide quick and effective support to solve customer problems in a professional manner	Employee Involvement Programs Database
Maintain High Revenue & Growth	Acquire new startups and companies	
Increase Market Share	entering your market	New Sales & Customer Portal

Figure 17: HPS Mapping Strategic Goals, Initiatives and Supporting EA Components

2. Business Process and Information Flow

The business process and information flows emphasize the role that EA plays in supporting business process analysis and improvement, as well as identifying and optimizing information flows with and between these processes. HPS's main Line of Business (LOB) services and associated information flows in each LOB. The below table (see figure 18) summarize some and not all LOB and information flows.

Line Of Business	Processes	Information Flows	Supporting EA Components
Sales	Sales Force (online or on the ground)	Daily Sales and Marketing follow-up between customer service and salespersons or customer service responsible of online sales.	Sales force tracking database, ERP payroll module and database, Supply Chain Management Database
	Sales Commissions	Daily recording and payment of sales commissions, in conjunction with base and bonus plans.	Sales Database, e- billing system, Customer database
Production & Shipping Operations	Production Work Centers	Daily Capacity Planning and Scheduling data for each work center	Production Ops Team
	Logistics	Weekly and Monthly report of carrier activities	Shipping & Handling Ops Team
Warehouse Operations	Automated Warehouse Management	Daily schedule of products move report in and out.	Warehouse Ops Team

Figure 18: HPS Line of Business and Flow of Information

3. Systems and Services

HPS complete suite of systems and services which is the backbone of information flow through all LOB includes the following systems and services:

- **Business Systems:** provide the IT services needed by HPS to align toward a global customer base with a focus in BRICS/Gulf Countries for Industrial Supplies, establishing Advanced Industrial System's line of business, improving the value of investments by innovations made in cost control accounting systems technology, substantially increasing profitability year over year.
- **Front End Information Systems:** support the services and applications which customers directly interact with. They include customer online ordering system also used for parts ordering (ecommerce), B2B system to deal with business customers and customer relationship management systems etc. With providing the value and services directly to customers, Front Office Information Systems is to help KHA to increase the market share and generate more revenue by leveraging IT technology.
- **Back End Information Systems:** support the business activities which customers are not directly interact with but required for enterprise operation. It covers from the inventory track system, supply chain management system, financial/account systems to human resource and payroll systems. Those systems are where enterprise to improve the efficiency of operation.
- Information Technology Infrastructure: is also comprised of the support services. They include HPS Internet of Things, AI, and Cloud Networks, Powerful Computing and Technical automation tools, etc. All the support by IT infrastructure provided services that improve productivity of employees and effectiveness of both Front End Information Systems and Back End Information Systems. By providing Standard Operating Procedures (SOP) and Industrial Cyber security solutions, it provides the solutions to protect the security and data privacy for both Front Back End Information Systems. The support services also facilitate the new opening of the remote sales offices, lower operation cost and promote organizational excellence for HPS.

4. Technology Infrastructure

The wide collection of advanced technologies systems and IT Infrastructure used by HPS provide the unit with a noticeable advantage over all of its competitors below is a list of the most important technologies used by HPS:

- Cloud Computing
- Industrial Fiber Optics Networks
- Machine Learning Solutions
- Artificial Intelligence Solutions
- Internet of Things Devices and Systems
- Advanced Next-Generation Firewalls
- Real Time High Sensitive Sensors
- Mobile Computing
- Decentralized Database Systems
- Industrial Cyber Security Solutions
- Industrial Virtualization Control Systems

5. IT Cyber Security aditabet. me

HPS Industrial Cyber Security Solutions help plants and critical infrastructure sectors defend the availability, reliability and safety of their industrial control systems (ICS) and plant operations.

From assessments and audits to response and recovery, the portfolio of end-to-end solutions leverages Honeywell's industry-leading expertise and experience in process control and cyber security. Having delivered more than 1,000 projects globally, HPS's certified experts help users improve their cyber security posture. Its managed services and complete solutions are designed for the specific needs of process control environments including Oil & Gas, Chemicals, Refining & Petrochemicals, Energy & Power, Minerals, Mining & Metals, and Pulp & Paper. With continuous investments in people, processes, and technology, HPS is committed to helping industrial users reduce risk and stay ahead of future classes of cyber-attacks.

HPS portfolio of Cyber Security Solutions starts from Application Whitelisting and Device Control Service, Assessments and Audits, Endpoint Protection, Industrial Cyber Security Risk Manager, Response and Recovery, Secure Media Exchange, Secure Network Refresh and does not end with Situational Awareness.

6. EA Standards

Important part of the EA framework adopted by "HPS" (PART OF PHASE G: TOGAF) is the implementation of Control Standards such as:

- 1. Implementing a system of controls over the creation and monitoring of all architectural components and activities.
- 2. Implementing a system to ensure compliance with internal and external standards and regulatory obligations(ISO/IEC/IEEE 42010:2011)
- 3. Developing practices that ensure accountability to a clearly identified stakeholder community, both inside and outside the organization.
- 4. Applying an Enterprise Security Architecture: ISO 27001 (security management) and ISO 31000 (risk management) integrated within the architecture allow for the exchange of information and the sharing of certain components. Thus, enterprise architecture and security architecture can co-exist and collaborate to avoid risks and provide an acceptable security level.
- 5. Applying Risk Management Standard Steps: Classification, Identification, Assessment, Mitigation and Monitoring.

Due to the high commitment of HPS toward applying and enforcing modern industry standards in all of its products and services, In 2016 HPS became the first subdivision in all large western companies to announce that it is 100% compatible with Capability Maturity Model Integration (CMMI®) Maturity Level 5 across all global operations.

7. Workforce Requirements

With more than 22,000 employees worldwide, including approx. 11,000 engineers, HPS has an unrelenting commitment to quality and delivering results in everything they make and do. They are passionate about creating new technologies and take pride in developing solutions that help solve the world's toughest challenges.

While growth, technology, and products are important, people are at the center of it all. HPS works for the greater good and give back to its communities. They also are a payfor—performance culture, with differentiated rewards for its top performers and offer programs that allow them to develop leaders from within.

HPS hired people with strong knowledge and deep expertise in their domains and help them to improve their knowledge and expertise with routine and modern training on all levels. In addition, HPS conducts semiyearly evaluation and assessment for every employee.

C. FUTURE ARCHITECTURE SUMMARY

1. Future Operating Scenario & Planning Assumption

Future operating scenarios describe a vision of situations that the enterprise will experience while conducting business in the newly architected environment. HPS develops planning assumptions to be added to those scenarios. These planning assumptions help the unit identifies new capabilities and resources that will be needed if the enterprise is to be successful in the future scenarios. (see figure 19).

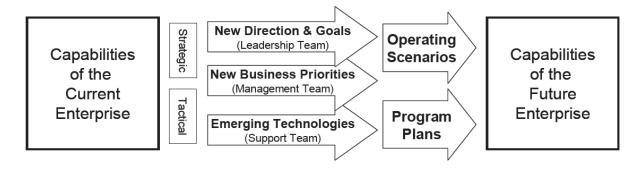


Figure 19: Drivers of Architectural Changes that might lead to Future Operating Scenarios

Understanding the drivers behind the change that happened is the first step in remodeling the EA to adapt that change. Secondly rerouting or even rebuilding critical phases of the framework to comply with the change using the capabilities and resources located in the planning assumption used in the previous architecture.

HPS use Scenario planning as a training technique for executives because senior executives are best equipped for long-range planning and managing uncertainty. Along those lines, future scenarios can seed risk-management efforts by highlighting the negative effects of uncertainty. They can act as the opportunistic counterpart to enterprise risk management. The warning signs identified in a future scenario effort might also be used to inform risk management efforts.

2. Updating Current & Future Views

This part is covered under the "Use and Maintain of the EA", so HPS follows the standard way of dealing with this part using the below techniques:

- 1. Use EA documentation to support planning making.
- 2. Regularly updates current and future views of the EA components, and link information in the EA repository to create high level and detailed perspectives of Enterprise Activities and resources in the current and in the future operating environment.
- 3. Maintain EA repository and related EA modeling and analysis capabilities.
- 4. Release annual updates to the EA management plan.
 - When working with the EA framework then it should be used to assist in the planning making (the transition plan) and not to mention that the methodology needs to be in place for the transition plan.
 - The EA repository needs to be maintained so every stakeholder in the organization can relate to the objects and terminology in the same way.
 - The EA management plan needs to be updated so it is matches the changes in the domain.

3. Sequencing Plan

The Sequencing Plan documents the timeframe for implementing the new EA components and artifacts. HPS is integrating its front end and back end systems into a more streamline architecture. The major components of this new architecture include the implementation of an Enterprise Service Bus, a Knowledge Warehouse, and the HPS Living Enterprise TM EA Repository. By using the EA repository authorized employees in all line of business will have access to enterprise level information.

HPS uses the below image (see figure 20) as a roadmap for developing the sequencing plan needed to done the integration of the above scenario.

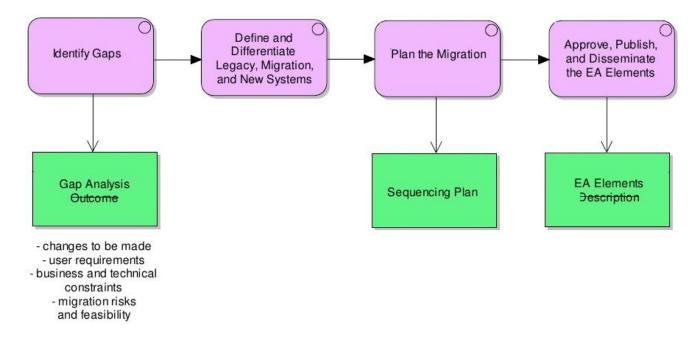


Figure 20: Developing a Sequencing Plan (HPS)

4. Configuration Management

HPS strategy to apply configuration management consists of the following steps:

- Identify and document the functional and physical characteristics of a configuration item,
- Control changes to those characteristics and,
- Record and report changes to processing and implementation status.

Based on the framework (TOGAF) adapted, HPS will use Configuration Management to support the following principles (see figure 21).

TOGAF Architectural Principles for an Enterprise	Does todays CM support this principle?	
Primacy of Principles	Currently CM tends to focus on Software Development (Models, Code and Tests) mainly, but needs to focus on all IT artefacts and even Enterprise artefacts in the longer term.	
Maximize Benefit to the Enterprise	Configuration Management directly assists in the management of information and its business systems.	
Information Management is Everybody's Business	Cm is supportive of this management but mainly in IT software development.	
Business Continuity	CM is crucial to supporting this principle.	
Common Use Applications	CM is crucial in assisting the enterprise manage these, particularly Service Oriented Architectures.	
Compliance with Law	CM helps report on this and could assist in mapping tables of policies and regulations to releases of software. Configurable yes, but not out the box.	
IT Responsibility	CM helps manage all this	

Figure 21: EA Principles Supported by Configuration Management

CHAPTER IV: BUZZWORD TOOL RESULTS

The following features the result of the buzzword's questionnaires tool. We can notice that due to the similarity in the nature and the use of these projects where all of them are deployed into industrial area and not for daily commercial use.

We can notice that too many buzzword terms or technologies are common "Very Related Category" (71% to 100%) between all the projects such as: **Internet of Things, Industry 4.0, React JS & React Native and Actionable Analytics.**

On the other side we can notice difference buzzword terms appearing for each project in both "Related Category (51% to 70%) and Semi Related Category (31% to 50%).

DynAMo Alarm and Operations Management Software

RESULT!!

Hello Fadi Tabet.

Your Company: Honeywell

Your Project: DynAMo Alarm and Operations Management Software

Buzz words applicable to your project are:

Very Related Category: (71%-100%) Artificial Intelligence (AI) 89.5

Internet of Things / Device Mash / Ambient UX 81.34

Smart Factory / Industry 4.0 72.5

Actionable Analytics / Self-Service Analytics 77.5

Related Category: (51%-70%) Information of Everything 54.67

Semi-Related Category: (31%-50%) React JS & React Native 32.5

Honeywell Pulse - Mobile App for Real-Time Plant Notification

RESULT!!

Hello Fadi Tabet,

Your Company: Honeywell

Your Project: Honeywell Pulse - Mobile App for Real-Time Plant Notification

Buzz words applicable to your project are:

Very Related Category: (71%-100%) React JS & React Native 100

Artificial Intelligence (AI) 91.5

Internet of Things / Device Mash / Ambient UX 84.67

Smart Factory / Industry 4.0 72.5

Actionable Analytics / Self-Service Analytics 90.5

Related Category: (51%-70%) Quantum Computing 57.5

Information of Everything 68.67

Semi-Related Category: (31%-50%) Net Neutrality / Encryption 34.37

Symphonite – Software for Supply Chain and Production Management

RESULT!!

Hello Fadi Tabet,

Your Company: Honeywell

Your Project : Symphonite - Software for Supply Chain and Production Management

Buzz words applicable to your project are:

Very Related Category: (71%-100%) React JS & React Native 89.20

Smart Factory / Industry 4.0 75.5

Internet of Things / Device Mash / Ambient UX 84.67

Actionable Analytics / Self-Service Analytics 84.5

Artificial Intelligence (AI) 81.5

Related Category: (51%-70%) Quantum Computing 52.67

Information of Everything 61.5

Semi-Related Category: (31%-50%) Net Neutrality / Encryption 33.5

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- http://investor.honeywell.com/IRW/CommitteeChart/4121346
- http://investor.honeywell.com/Governance-Home/Index?KeyGenPage=1073751125
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