

Applications and Benefits of Quality Improvement Efforts in Service Operations

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Abstract

The Six Sigma methodology is a well-known process improvement approach. However, since this approach does not target fundamental changes to the structure of the underlying production/service processes used to create products/provide services, organizations typically hit a point beyond which process improvements are difficult, if not impossible, to achieve. To address this issue, Six Sigma applications have grown to include the design and redesign of both products and services, which is known as Design for Six

Sigma (DFSS). The DFSS methodology focuses on building quality into the design of products/services. Previous discussions in the literature have pointed out that there is no standard framework to guide the use of the DFSS methodology. It has been suggested, however, that the DMADV (Define, Measure, Analyze, Design, and Verify) methodology is an appropriate approach to use when designing service processes, as this approach specifically addresses redesigning processes, which is a common occurrence in service-based organizations. This presentation will demonstrate the use of the DFSS methodology in services through examples from case studies conducted in a wide variety of industries including supply chain, IT, and healthcare.

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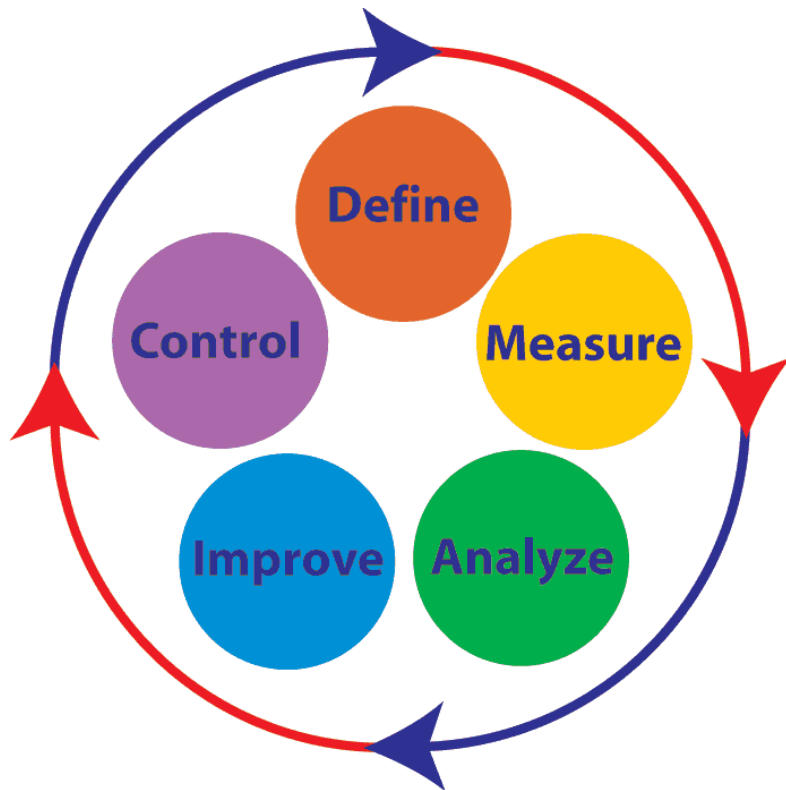
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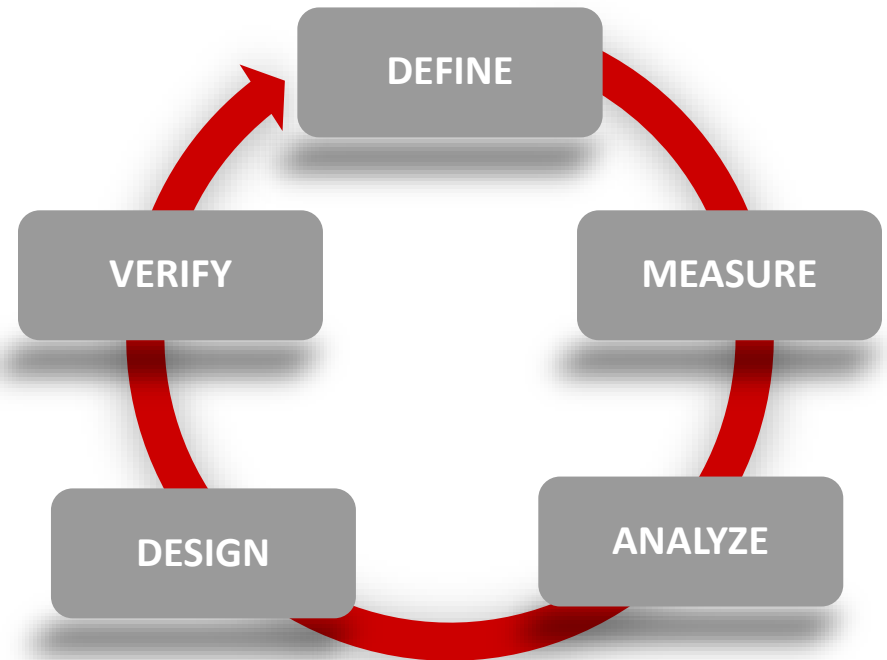
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Improvement Approaches

- Six Sigma: DMAIC



- Design for Six Sigma: DMADV



DMADV Approach for Services

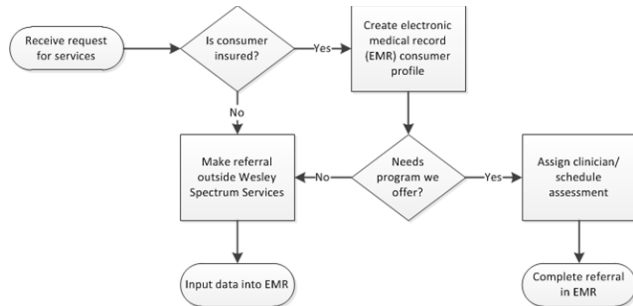
Define	Measure	Analyze	Design	Verify
Create: <ul style="list-style-type: none"> • Project charter • SIPOC diagram* • Current state process map/flowchart 	Perform a user needs analysis: <ul style="list-style-type: none"> • Conduct interviews • Create affinity diagrams • Develop and administer a needs prioritization survey 	<ul style="list-style-type: none"> • Prioritize needs (based on survey results) • Establish metrics • Collect baseline measures 	<ul style="list-style-type: none"> • Develop design ideas (using brainstorming & benchmarking) • Prioritize design ideas (using multi-voting, etc.) • Establish the final design • Implement the new process 	<ul style="list-style-type: none"> • Collect verification measures • Revise the new process, as needed

*SIPOC diagram – Suppliers, Inputs, Process, Outputs, Customers diagram

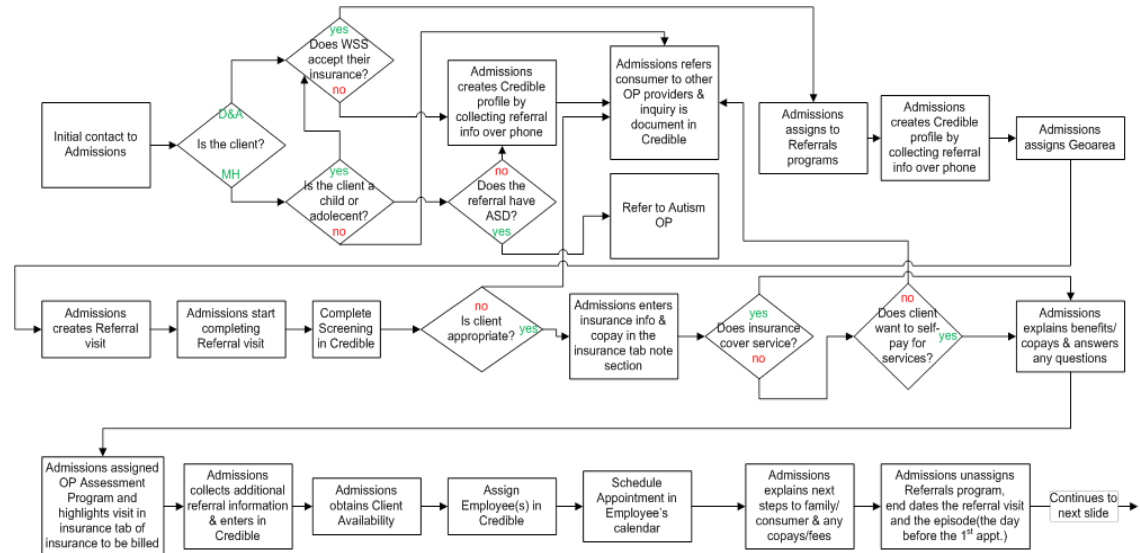
Current & Future State Process Maps

Redesigning the intake process (for a behavioral healthcare provider)

Current State

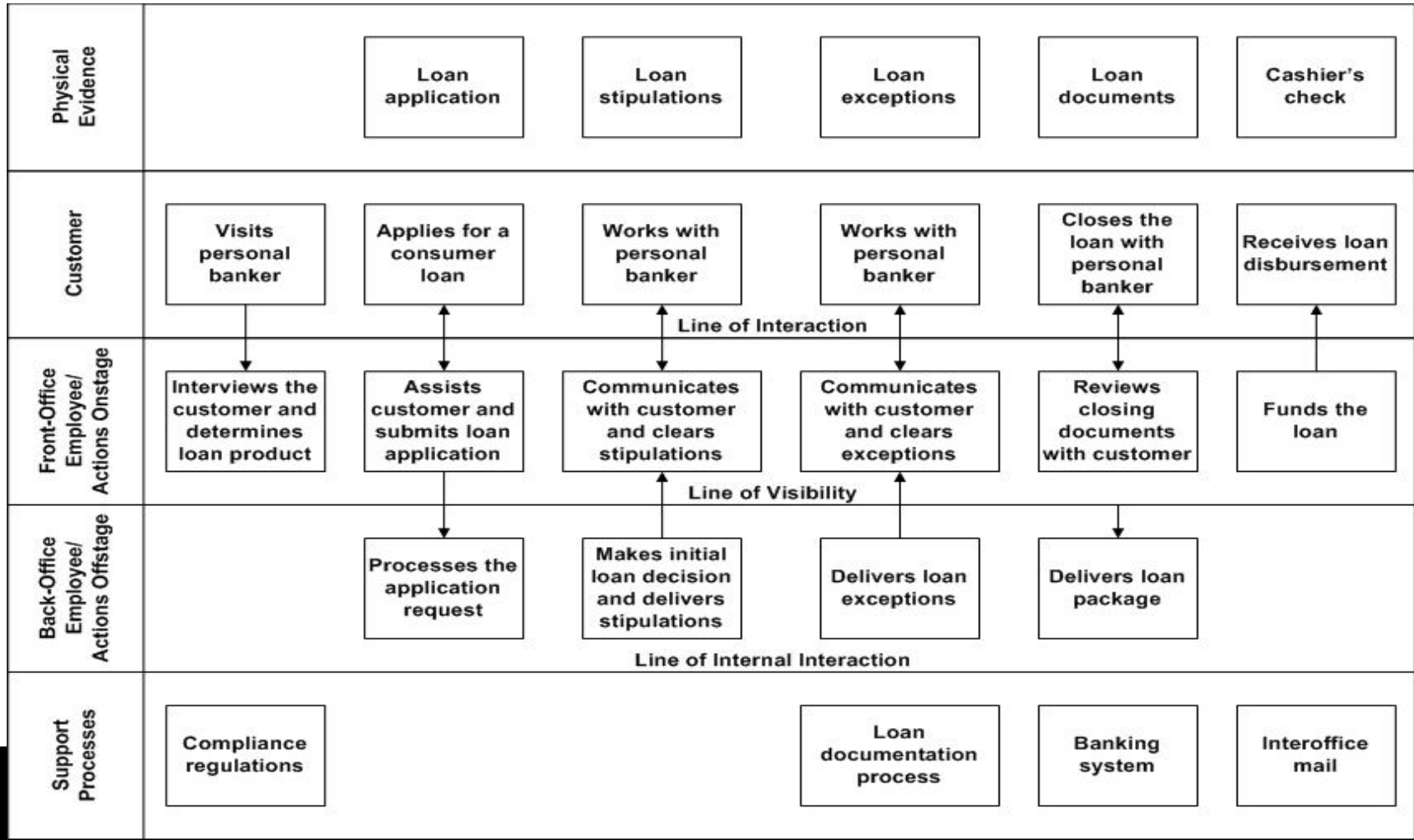


Future State

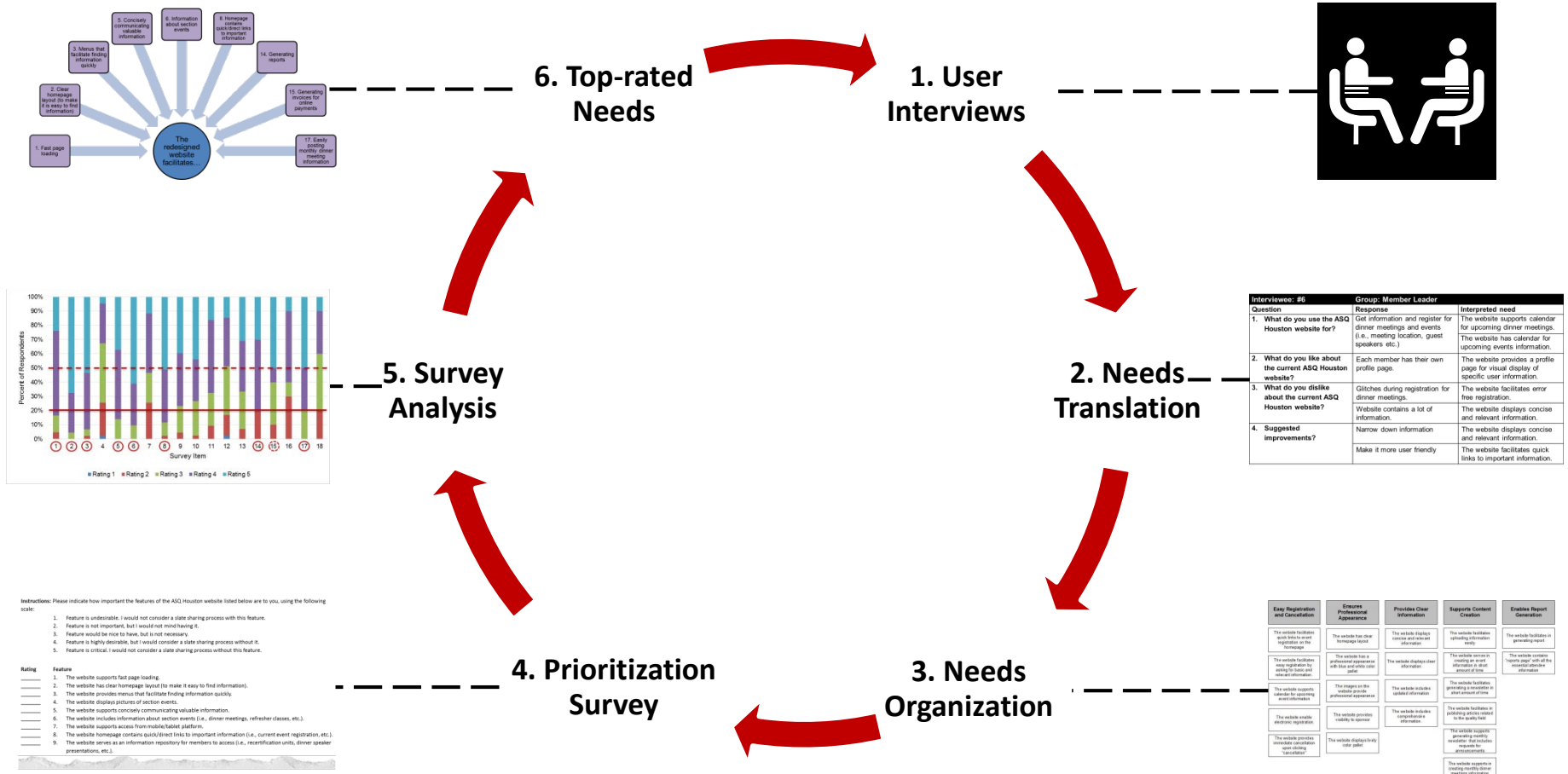


Service Blueprints

Designing a policies & procedures manual (for a consumer lending dept. at bank)



User Needs Analysis



Benchmarking & Prototyping

Redesigning a website (for the local section of a professional society)

Other websites:

1. www.sme.org
2. www.asee.org
3. www.asme.org
4. www.api.org
5. www.asq.org
6. www.apics.org
7. www.pmi-houston.org
8. www.uh.edu/cot/lsscrt
9. www.wordpress.org
10. www.adobe.com
11. www.guardian.co.uk
12. www.blogspot.com
13. www.amazon.com

The screenshot shows the website for the Greater Houston Section of ASQ. The header includes the ASQ logo, the text 'Greater Houston Section' and 'The Global Voice of Quality™', and social media icons for LinkedIn, Facebook, and Twitter. A navigation bar contains links for Home, About Us, Membership, Events, Articles & Information, Career Development, About ASQ, and Technical Assistance. A search bar is located in the top right. The main content area features a blue banner with a white box containing the handwritten text 'SECTION'S DINNER MEETING PICTURE' and a blue box with the text 'Professional Development Dinner Meetings' and 'Learn, network & earn recertification units at monthly meetings'. Below the banner are three columns of committee information: Programs Committee, Education Committee, and Membership Committee; Conference Committee, Chief Proctor, and Community Outreach Committee; and Sponsorship Committee, Recertification Committee, and Arrangements Committee. A grey bar at the bottom contains a 'SPONSORS SCROLL' section with left and right arrows. The footer includes a 'Newsletter Subscription' form with an email address field and a 'Subscribe' button, and contact information for Shipul Web Design and Tendenci Membership Management Software.

Options Profiling

Redesigning an information sharing process (for tracking the movement of barges at a marine transportation services organization)

Site Structure	Access to Information	Update Schedule & Frequency	Distribution of Information	Format of Information	Application Compatibility
<u>Create library for each slate</u>	Access to all within corporation; no proprietary information	<u>Daily</u>	<u>Direct links via email</u>	<u>Microsoft Excel spreadsheet</u>	<u>Microsoft platform</u>
Create one library for all slates	Access to all within SRM + Chemicals & Refining organization schedulers	Multiple times daily	Text/SMS alerts	Plain text	<u>Web-based</u>
Create own sub-site for slate within Inland Site	<u>Utilize current Outlook contact groups</u>	Only as required/as new information is available	Auto-forward through Outlook	Web text	<u>OFR (Order Fulfill to Revenue)</u>
Create library for each Transportation Coordinator	Grant access by position (not name of individual)	Update by a specific time each day	None		<u>Microsoft Outlook</u>
Create library for each customer	Give access to slates only by request				
	<u>Individual login for 3P</u>				

Created 25 Possible Profiles

Concept Selection Matrix

Selection Criteria	Design Concept										
	(1 – Will not meet criteria; 2 – Will fulfill criteria; 3 – Will exceed expectations for criteria)										
	A	B	C	F	G	I	N	O	P	V	X
Update interval (updates/week)	2	3	2	2	2	2	2	2	2	2	2
Ease-of-use (5 pt. scale)	4	5	4	3	3	3	3	3	4	3	2
Number of slates printed daily	2	2	2	2	2	2	2	2	2	2	2
Everyone who needs access have access	3	3	3	2	2	1	2	2	3	3	3
Information can be accessed through the web	2	2	2	2	2	2	2	2	2	2	2
Compatible with Microsoft Excel?	3	3	3	3	3	3	3	3	3	3	3
Compatible with Microsoft Outlook	2	2	2	2	2	2	2	2	2	2	2
Compatible with OFR	3	3	3	3	3	3	3	3	3	3	3
Compatible with SharePoint	2	2	2	2	2	1	2	2	2	2	2
TOTAL	23	25	23	21	21	19	21	21	23	22	21

Baseline & Verification Measurements

Designing an IT change management system (for a mid-size accounting firm)

Metric No.	Need Nos.	Metric	Units	Previous System	New System	Change
1	1, 3	Time to document a change	Minutes	---	1.65 min.	Improved
2	1-3, 9	System ease-of-use	5 pt. scale	2	4.5	Improved
3	2, 9	Time to find information	Seconds	---	9 s	Improved
4	3-5, 7, 10	Documents aspects of changes	Yes/No	No	Yes	Improved
5	4-7, 10	System effectiveness	5 pt. scale	1	4	Improved
6	6	Communicates changes	Yes/No	No	Yes	Improved
7	8	Requires appropriate authority to approve changes	Yes/No	No	Yes	Improved

Benefits of Using DFSS in Services

- Involves those who do the work/know the process best in designing/redesigning it
- Engenders buy-in for the new process implemented
- Verification measurements are at least as good or better than baseline measurements
 - New process fulfills the needs for which it was designed