



Mr. Hans Crampe

Vice CEO AZ Delta

Scientific guest docent Lean Management

Value from lean in a Hospital

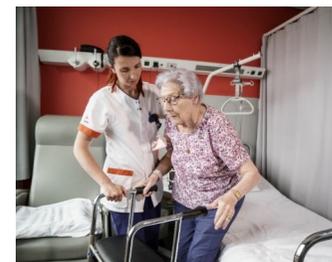


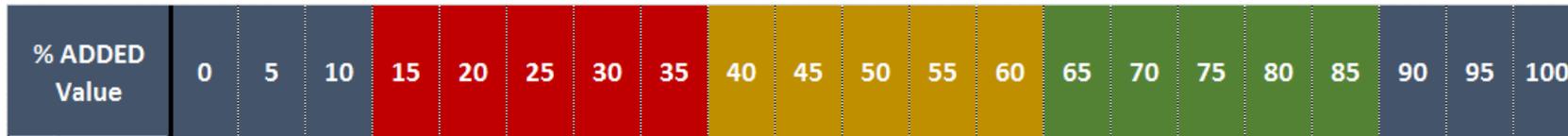
Value from lean in a hospital

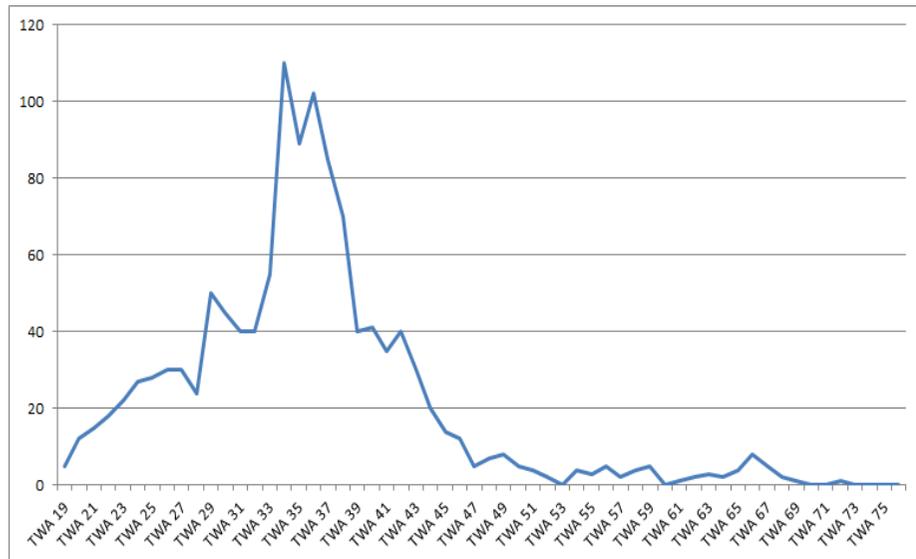
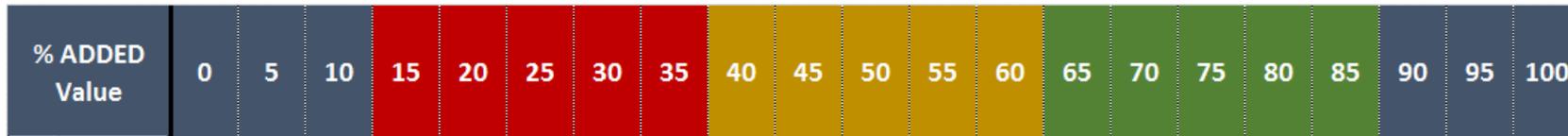
Hans Crampe - Vice CEO

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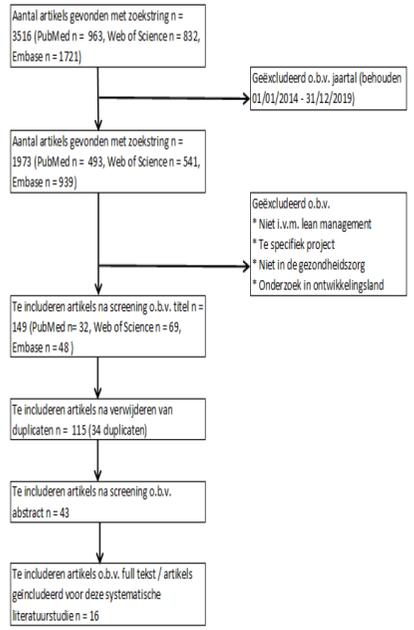


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Item	Vraag
1	De dertig seconden regel*
2	5S en visueel management*
3	Single-Minute Exchange of Die (SMED)
4	De SIX BIG LOSSES en Overall Equipment Effectiveness (OEE)
5	Het spaghetti diagram en systematische layout-planning*
6	De wet van Parkinson of timeboxing*
7	Kwantitatieve Toegevoegde Waarde analyse*
8	Procesanalyse d.m.v. MAKIGAMI of Value Stream Map*
9	Probleemanalyse d.m.v. 5 WHY's
10	Probleemanalyse d.m.v. PDCA of DMAIC*
11	Probleemanalyse d.m.v. A3-methode
12	Probleemanalyse d.m.v. visgraatdiagram, fishbone of Ishikawa*
13	Procesopvolging d.m.v. scoreborden*
14	Procesopvolging d.m.v. POKA YOKE en ANDON*
15	Analyse variantie van processen (Z-waarde, Cp)*
16	Bottleneck analyse d.m.v. TOC
17	TAKT-berekening*
18	SLA b.v. TAKT-tijden bepalen*
19	Procesanalyse door het gebruik van Control charts
20	Bestaafingszaken berekenen op basis van continuïteit en variantie*
21	Gebalanceerde werkplanning uitwerken (Heijunka)*
22	Bepaling klantenbehoeften o.b.v. Voice of the customer (VOC)
23	Bepaling klantenbehoeften o.b.v. Critical to Quality (CTQ)
24	Analyse van proxyvariabelen*
25	Survey analyse*
26	Correlatie analyse*
27	Bepaling Service level agreement en serviceniveau o.b.v. KANO-model*
28	Bepaling Service level agreement en serviceniveau o.b.v. Quality Function Deployment*
29	Opmaak veranderdiagnose op individueel niveau via DISC of MBTI*
30	Opmaak veranderdiagnose op organisatieniveau (Kotter)*
31	Projectmanagement via RACI-model en SCRUM-methode
32	Verbetercultuur en cliëntgerichtheid bij alle medewerkers door GEMBA-walk, KAIZEN en KATA-sessies*
33	Doelstellingen van afdelingen afstemmen met algemeen beleid via HOSHIN KANRI
34	Een LEAN-oleidingsplan kunnen uitwerken o.b.v. kennisbehoeften*

Zelfevaluatie LEAN-tools

Er is een tabel met 10 vragen en 5 opties (A-E) met ja/nee/misschien/andere/andere antwoorden.

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Critical Successful Factors (CSFs) for Successful Implementation of Lean Tools



Assessment of critical failure factors (CFFs) of Lean Six Sigma in real life scenario

Evidence from manufacturing and service industries

Raja Sreedharan V., Gopikumar V. and Smitha Nair

S.No	Critical failure factors	References
1	Lack of top management commitment and involvement	Psychogios <i>et al.</i> (2012), Albliwi <i>et al.</i> (2014), Antony <i>et al.</i> (2014), Jie <i>et al.</i> (2014), Pamfilie <i>et al.</i> (2012), Kwaka and Anbari (2006)
2	Lack of top management's awareness about benefits of Lean and Six Sigma	Psychogios <i>et al.</i> (2012), Albliwi <i>et al.</i> (2014)
3	Lack of clear vision and future plans	Albliwi <i>et al.</i> (2014), Pamfilie <i>et al.</i> (2012)
4	Lack of leadership	Albliwi <i>et al.</i> (2014), Pamfilie <i>et al.</i> (2012), Sreedharan, Balagopalan, Murale and Arunprasad (2018)
5	Lack of proper communication about future benefits expected from project by top management	Delgado <i>et al.</i> (2010), Antony <i>et al.</i> (2014), Pamfilie <i>et al.</i> (2012)
6	Lack of reward and recognition by top management	Psychogios <i>et al.</i> (2012), Antony <i>et al.</i> (2014), Pamfilie <i>et al.</i> (2012)
7	Lack of Lean Six Sigma organization Structure	Psychogios <i>et al.</i> (2012)
8	Internal resistance against culture change	Psychogios <i>et al.</i> (2012), Albliwi <i>et al.</i> (2014), Delgado <i>et al.</i> (2010), Desai <i>et al.</i> (2009)
9	Weak deployment infrastructure	Albliwi <i>et al.</i> (2014)
10	Poor project prioritization	Albliwi <i>et al.</i> (2014), Desai <i>et al.</i> (2009), Sreedharan and Sunder (2018)
11	Lack of knowledge about project selection tool	Psychogios <i>et al.</i> (2012)
12	Lack of alignment between the objective of the project and strategic objective of the company	Psychogios <i>et al.</i> (2012), Albliwi <i>et al.</i> (2014)
13	Lack of experience in Lean Six Sigma deployment and implementation	Albliwi <i>et al.</i> (2014), Sreedharan and Sunder (2018)
14	Lack of resources	Albliwi <i>et al.</i> (2014), Desai <i>et al.</i> (2009), Kwaka and Anbari (2006)
15	Lack of refresher classes in the application of Lean Six Sigma	Desai <i>et al.</i> (2009)
16	Lack of process owner engagement	Psychogios <i>et al.</i> (2012), Albliwi <i>et al.</i> (2014)
17	Lack of process owner's awareness about the Lean Six Sigma and process thinking	Psychogios <i>et al.</i> (2012), Albliwi <i>et al.</i> (2014)
18	Poor selection of candidate for Belt training	Albliwi <i>et al.</i> (2014), Kwaka and Anbari (2006)
19	Ineffective training programs	Psychogios <i>et al.</i> (2012), Albliwi <i>et al.</i> (2014), Andersson <i>et al.</i> (2014), Desai <i>et al.</i> (2009)
20	Lack of employee engagement	Psychogios <i>et al.</i> (2012), Albliwi <i>et al.</i> (2014)
21	Lack of knowledge about Lean Six Sigma techniques, tools and practices	Albliwi <i>et al.</i> (2014), Delgado <i>et al.</i> (2010)
22	Lack of team autonomy	Psychogios <i>et al.</i> (2012), Albliwi <i>et al.</i> (2014)
23	Lack of cross-functional team	Antony <i>et al.</i> (2014), Thomas <i>et al.</i> (2009)
24	Lack of roadmap to guide the project execution	Albliwi <i>et al.</i> (2014), Srinivas and Sreedharan (2018)
25	Ineffective project management	Psychogios <i>et al.</i> (2012), Albliwi <i>et al.</i> (2014)
26	Poor selection of Lean Six Sigma tools	Psychogios <i>et al.</i> (2012), Albliwi <i>et al.</i> (2014), Delgado <i>et al.</i> (2010)
27	Lack of understanding about customer type and their demand	Albliwi <i>et al.</i> (2014), Antony <i>et al.</i> (2014)
28	Lack of employees' awareness about Lean Six Sigma	Psychogios <i>et al.</i> (2012), Sreedharan, Raju, Rajkanth and Nagaraj (2018)
29	Lack of measurement system's performance	Albliwi <i>et al.</i> (2014), Desai <i>et al.</i> (2009)
30	Lack of usage of statistical tools for improvement	Albliwi <i>et al.</i> (2014), Rejikumar <i>et al.</i> (2018)
31	Poor communication and organization	Albliwi <i>et al.</i> (2014), Antony <i>et al.</i> (2014)
32	Lack of usage of information and communication tools	Psychogios <i>et al.</i> (2012), Sreedharan, Rajasekar, Santhosh Kannan, Arunprasad and Trehan (2018)

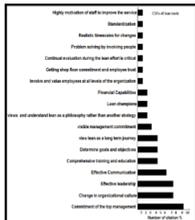
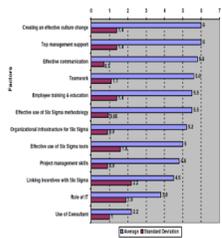
33	High implementation cost	Albliwi <i>et al.</i> (2014), Psychogios <i>et al.</i> (2012)
34	Poor estimation of project cost	Albliwi <i>et al.</i> (2014), Sreedharan and Sunder (2018)
35	More lead time	Albliwi <i>et al.</i> (2014), Delgado <i>et al.</i> (2010)
36	Lack of control techniques	Delgado <i>et al.</i> (2010)
37	Lack of human factors consideration	Psychogios <i>et al.</i> (2012), Albliwi <i>et al.</i> (2014), Delgado <i>et al.</i> (2010)
38	Lack of innovations	Antony <i>et al.</i> (2014)
39	Lack of concurrent approach in problem solving	Thomas <i>et al.</i> (2009), Sreedharan, Sandhya and Raju (2018)
40	Lack of knowledge about performance metrics	Franchetti and Roth (2010), Laureani <i>et al.</i> (2010)
41	Lack of continuous monitoring approach	Delgado <i>et al.</i> (2010), Sreedharan and Sunder (2018)
42	Lack of support from suppliers and service providers	Andersson <i>et al.</i> (2014)
43	Lack of linking of LSS with other quality tools like ISO, TQM	Albliwi <i>et al.</i> (2014), Wei <i>et al.</i> (2010)
44	Lack of linking of LSS with suppliers and other channel partners	Albliwi <i>et al.</i> (2014), Sreedharan and Sunder (2018)



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Critical Successful Factors (CSFs) for Successful Implementation of Lean Tools

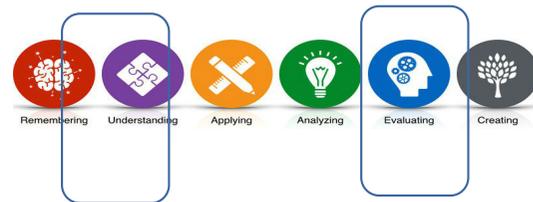
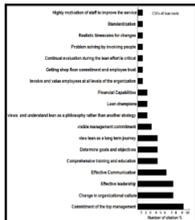
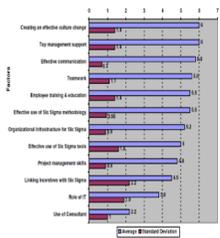
Employee training	<input checked="" type="checkbox"/>
Effective use of tools	<input checked="" type="checkbox"/>
Creating an effective culture change	<input checked="" type="checkbox"/>
Top management support	<input checked="" type="checkbox"/>
Teamwork	<input checked="" type="checkbox"/>



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Testing

Self-evaluation

Critical Successful Factors (CSFs) for Successful Implementation of Lean Tools

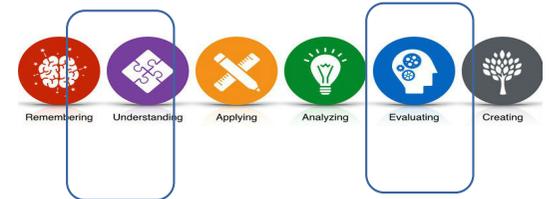
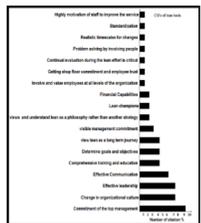
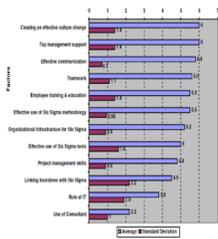
Employee training	<input checked="" type="checkbox"/>
Effective use of tools	<input checked="" type="checkbox"/>
Creating an effective culture change	<input checked="" type="checkbox"/>
Top management support	<input checked="" type="checkbox"/>
Teamwork	<input checked="" type="checkbox"/>



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Testing

Self-evaluation

Critical Successful Factors (CSFs) for Successful Implementation of Lean Tools

Employee training	<input checked="" type="checkbox"/>
Effective use of tools	<input checked="" type="checkbox"/>
Creating an effective culture change	<input checked="" type="checkbox"/>
Top management support	<input checked="" type="checkbox"/>
Teamwork	<input checked="" type="checkbox"/>

	Bewezen effect	Kennisniveau
5S	2/patiënt	35
Variatie analyse Cp /TAKT	17 /patient	3

		Mean	Correlatie
Algemene tevredenheid	8,2	Manier van lesgeven	7,8 0,4
		Toepasbaarheid	6,9 0,4
		Documentatie	4,7 -0,1
		Locatie	4,5 0,1

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Remove waste

50 WASTE activities

1. Walking;
2. The intake;
3. The hand-overs;
4. Waiting

Toegevoegde Waarde Analyse A-dienst											Score	35
	8 uur	9 uur	10 uur	11 uur	12 uur	13 uur	14 uur	15 uur	16 uur	17 uur	gemiddelde	
VERPLEEGKUNDIGE	60	70	5	5	65	5	80	5	5	65	37	
FACILITAIR	80	90	5	5	60	5	45	5	5	30	33	
ERGO	5	5	85	85	5	5	5	85	75	5	36	
KINE	5	5	90	75	5	5	5	90	70	5	36	
	38	43	46	43	34	5	34	46	39	26	35	



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1

Remove waste

2

Remove variation

Capacity		Staffing	
FTE	availability/FTE	available hours/year	available hours/day
Employer 1	1420	24000	66
Employer 2	1430		
Employer 3	1440		
Employer 4	1450		
Employer 5	1460		
Employer 6	1470		
Employer 7	1480		
Employer 8	1490		
Employer 9	1500		
Employer 10	1510		
Employer 11	1520		
Employer 12	1530		
Employer 13	1540		
Employer 14	1550		
Employer 15	1560		
Employer 16	1570		
Employer 17	1580		
Total FTE	15	1590	66
	1610		
	1620		
	1630		
	1640		
	1650		
	1660		
			SD
			12
			2*SD
			23
			Year
			8398
			FTE
			5



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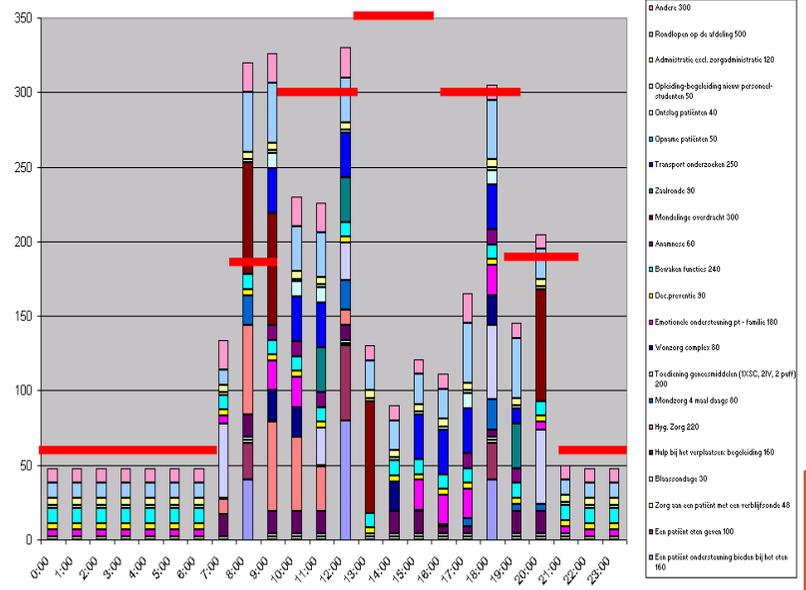
Remove waste

2

Remove variation

3

Balance



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- 1 Remove waste
- 2 Remove variation
- 3 Balance
- 4 Expedition teams

education program	170
LEAN project	50
mean value/project	100000



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Q4 2018 – Q1 2019

Value Stream Map "job application"	167.800	
Syst Lay-out "cleaning process"	86.135	
Value stream map "one day surgery"	161.000	
Optimisation "work scheduling"	45.000	
5 S "warehouse & stockrooms"	130.000	
Heijunka "medical imaging unit"	327.000	
Time Boxing "handovers geriatric unit"	45.000	
Added Value Analysis "line process"	152.300	
TAKT-times "coloscopie unit"	120.000	
Value stream map "cardiologic unit"	200.000	
Value stream map "medication"	500.000	
Value stream map "central sterilisation unit"	150.000	
Proces analysis "out patient clinic (10)"	90.000	
	2.174.235	10'



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Q4 2018 – Q1 2019

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Proces analysis "out patient clinic (10)"	90.000	
	2.174.235	10'

Q2 2019 Q3 2019

TCO "software lic."	350.000	
Value stream map "rehabilitation unit"	150.000	
Added Value Analysis "social workers"	150.000	
Value Stream Map "diabetes unit"	150.000	
Value Stream Map "GP"	150.000	
Time Boxing "handovers nursing unit"	150.000	
Added Value Analysis "paramedical services"	150.000	
Added Value Analysis "social workers"	150.000	
TAKT-times "internal patient transport"	150.000	
Added Value Analysis "external patient transport"	150.000	
Value stream map "lab"	150.000	
Value stream map "maternity ward"	150.000	
Proces analysis "psychiatric unit"	150.000	
	2.150.000	10'



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Q4 2018 – Q1 2019

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Q2 2019 Q3 2019

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Value stream map "lab"	150.000	
Value stream map "maternity ward"	150.000	
Proces analysis "psychiatric unit"	150.000	
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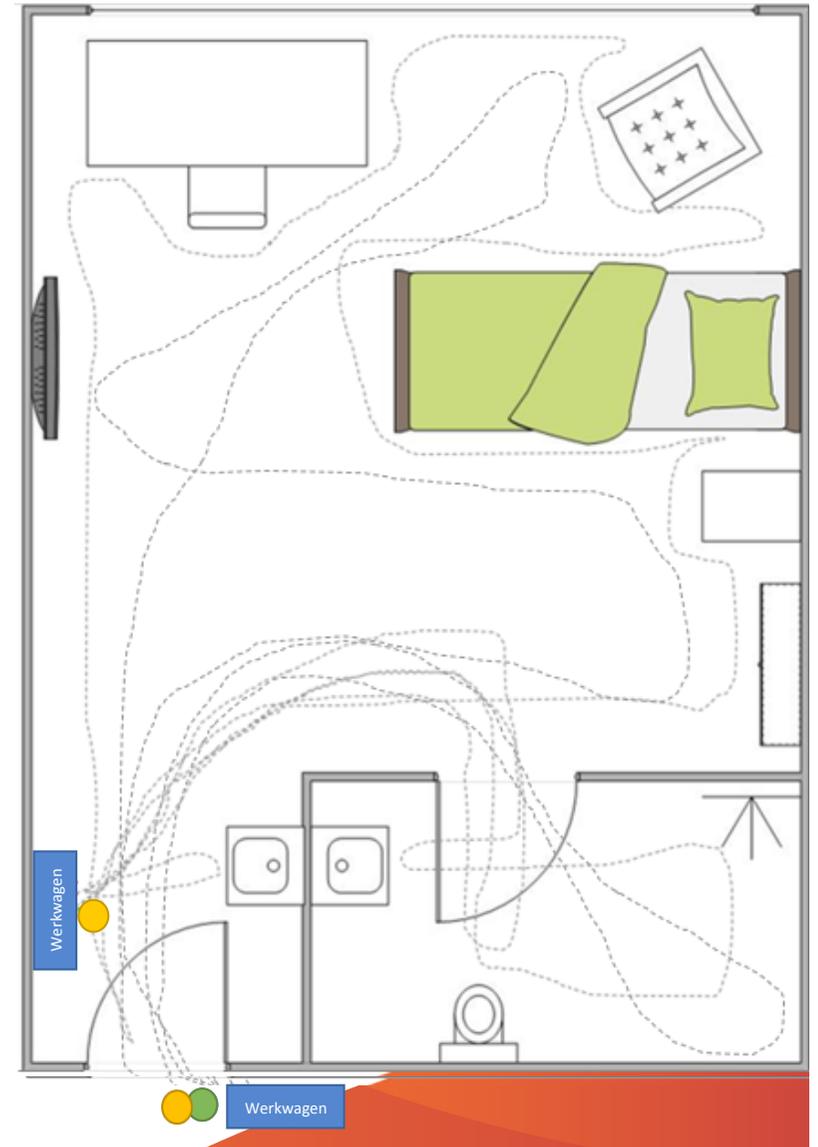
Q3 2019 Q4 2019

Value Stream Map "facturation process"	150.000	
Syst Lay-out "operating theatre"	150.000	
Value stream map "oncology unit"	150.000	
Value stream map "cath lab"	150.000	
Added Value Analysis "supplementary nutrition"	250.000	
Added Value Analysis "ombudsperson"	150.000	
Value stream map "software development"	150.000	
Syst. Layout "anatomopathology lab"	250.000	
TAKT-times "radio isotopen unit"	150.000	
Value stream map "delivery quarter"	150.000	
Time boxing "handovers" nursing units	150.000	
Value stream map "operation theatre"	150.000	
Proces analysis out patient clinic (10)	150.000	
	2.150.000	10'

1. **AS IS routing:** 16,37 min (mean + 2*STDEV)
2. **TO BE routing:** 15,27 min (mean + 2*STDEV)
3. **TO BE routing:** 13,89 min (mean + 2*STDEV)



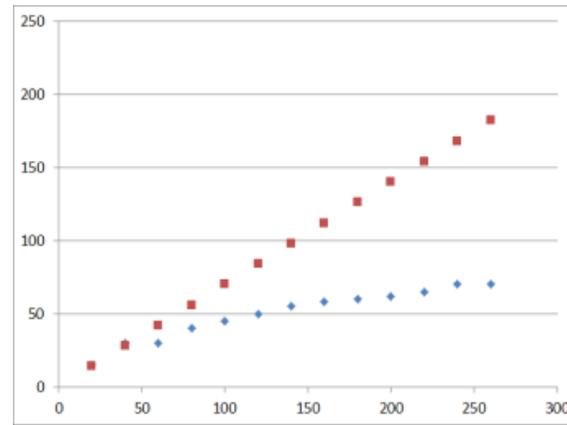
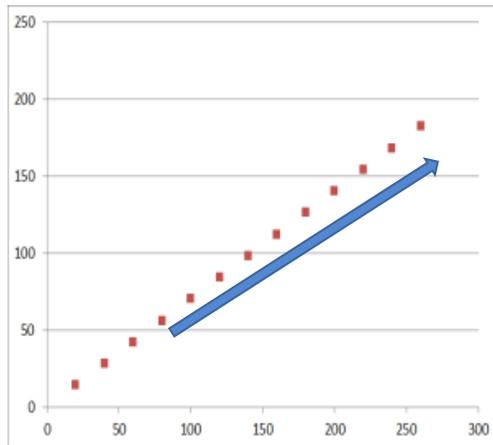
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Increase staf levels



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Increase staf levels

2

Solution is more expensive than problem



% ADDED Value	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
 azdelta De toekomst.	0	11	22	33	44	55	66	77	88	99	110	121	132	143	154	165	176	187	198	209	220

1

Increase staf levels

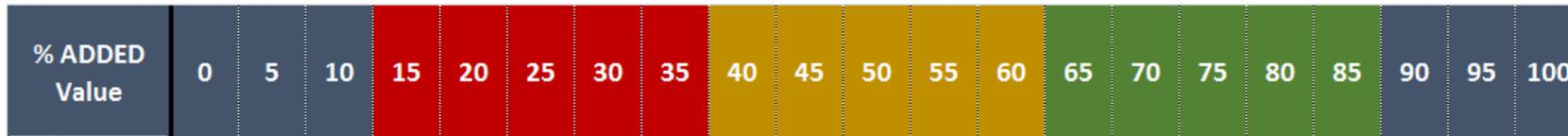
2

Solution is more expensive than problem

3

Inform/autom. process which is not under control





The combination of bidirectional communication between clinical, business, and building systems, the implementation of smart, semi-autonomous devices or sensor networks, and the use of analytics within a hospital creates endless possibilities for the development of smart, efficient, and effective hospital processes
("MacKenzie Health")

