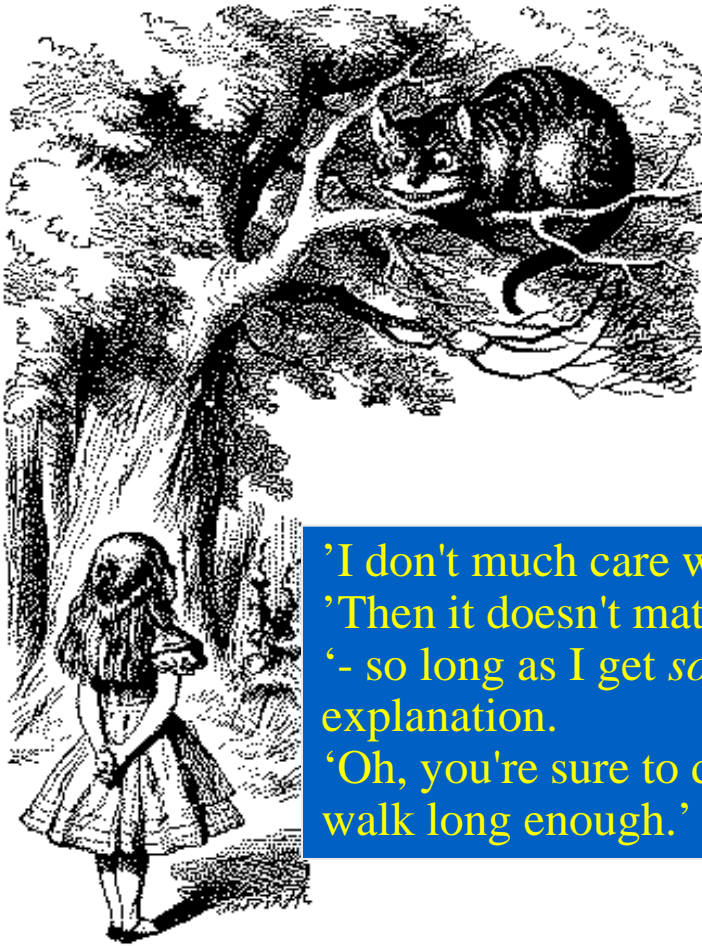


Why to Measure



‘Cheshire Puss,’ she began, ... ‘Would you tell me, please, which way I ought to go from here?’
‘That depends a good deal on where you want to get to,’ said the Cat.

'I don't much care where –' said Alice.
'Then it doesn't matter which way you go,' said the Cat.
'- so long as I get *somewhere*,' Alice added as an explanation.
'Oh, you're sure to do that,' said the Cat, 'if you only walk long enough.'

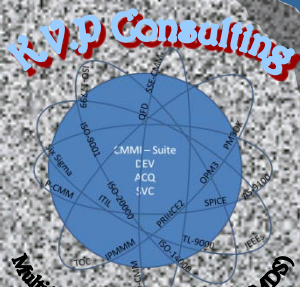


Tell me where you want to be and I will show (measure) you the way



Bug Database

~33000 Records
With
36 Attributes

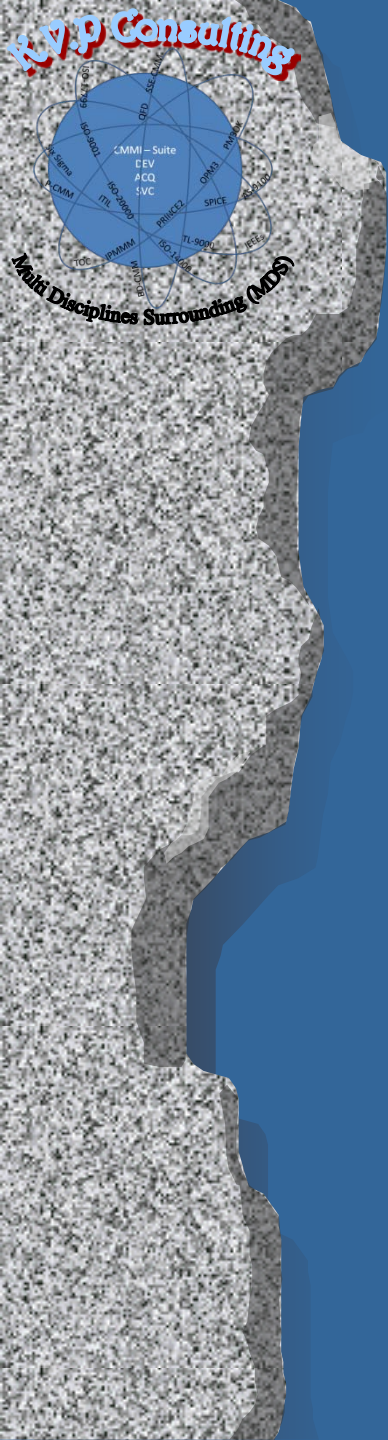


"which way I ought to go from here"

Call Center — Calls Database

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000
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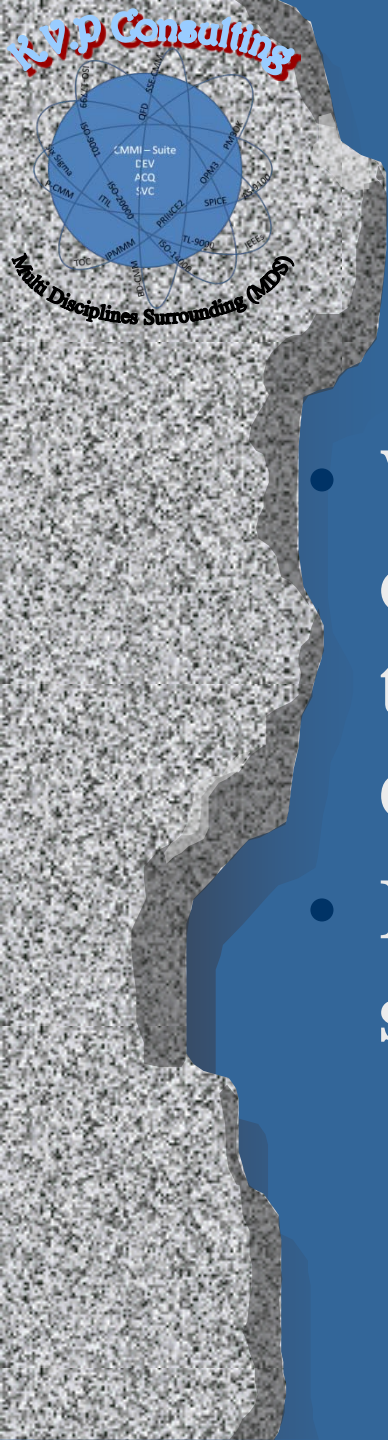
~45000 Records
With
22 Attributes



Utilizing Project Current **Data** for Better Management **Decisions**

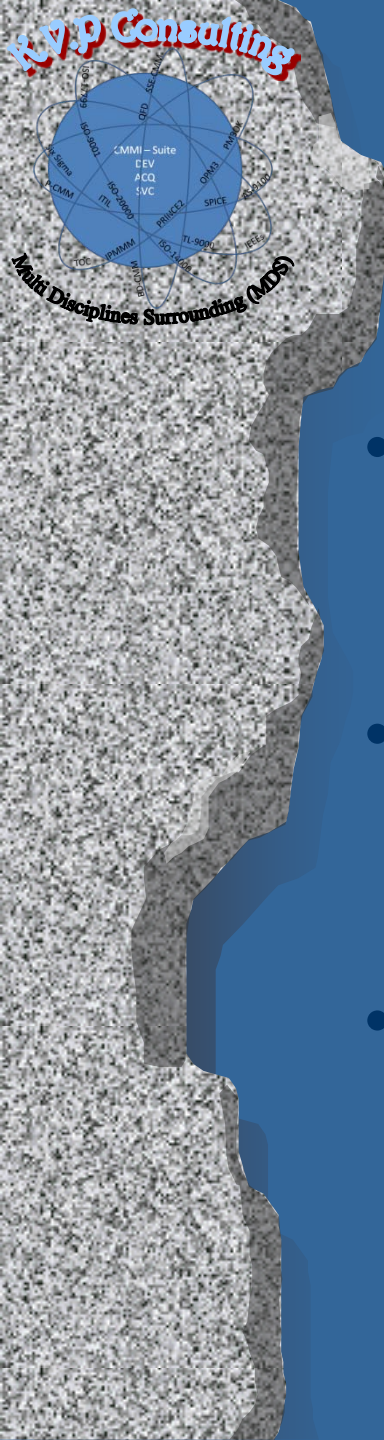
Increasing Project Data Usability

Real Life Case Study



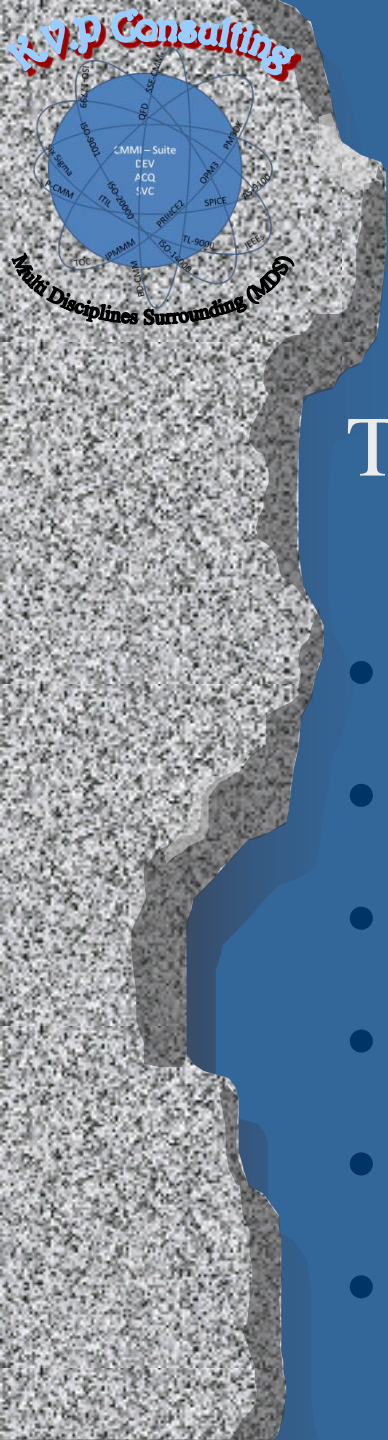
Disclaimer

- We have based the presentation content on the current program raw data, therefore presentation accuracy or level details presented may impacted by it
- In some cases we guesstimate on data or some of its segments



Unit Improvement Objectives

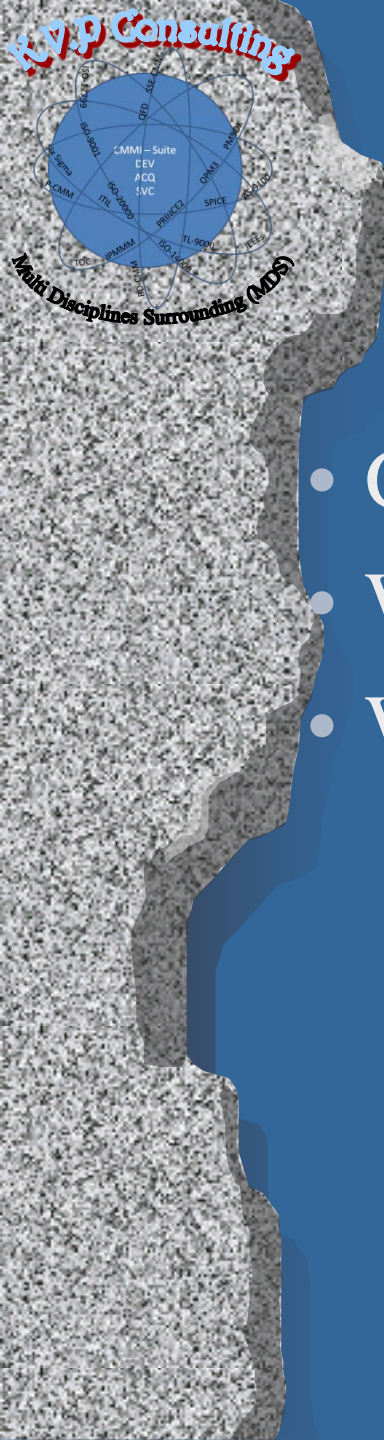
- Improve communication among the different stakeholders
- Increase system interfaces management and control efficiency
- To increase insight to effort deviation for better planning



Presentation Objectives

To give the program and the division ideas,
how to:

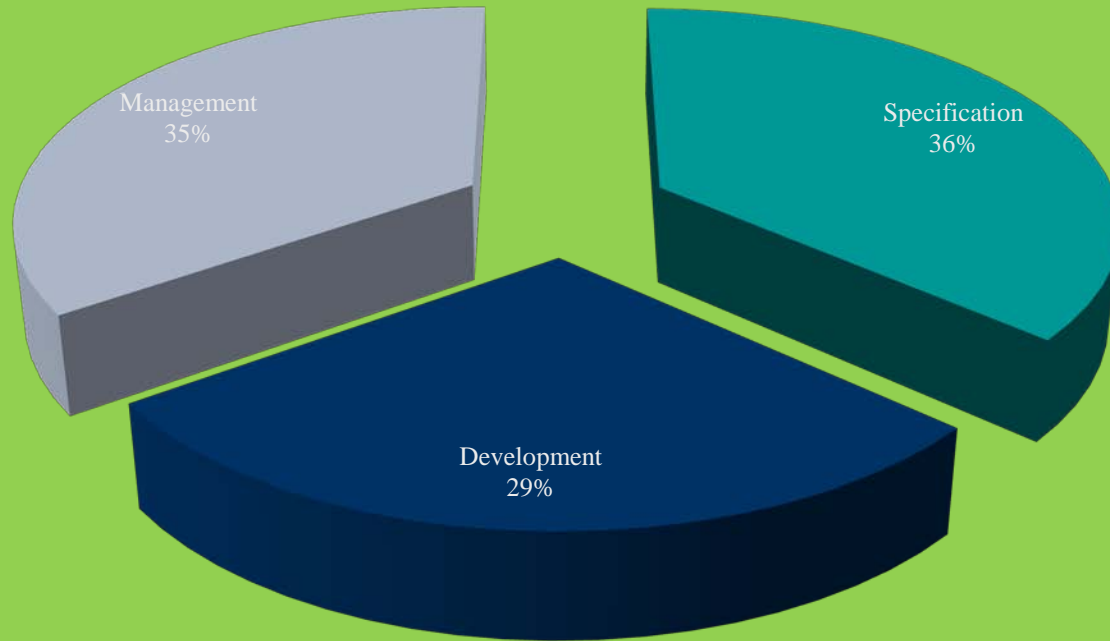
- Increase product / deliverable quality
- Reduce project lifecycle duration
- Reduce project cost
- Increase resource (human) utilization
- Increase processes efficiency
- Have better control on effort distribution



The Presentation Will Not

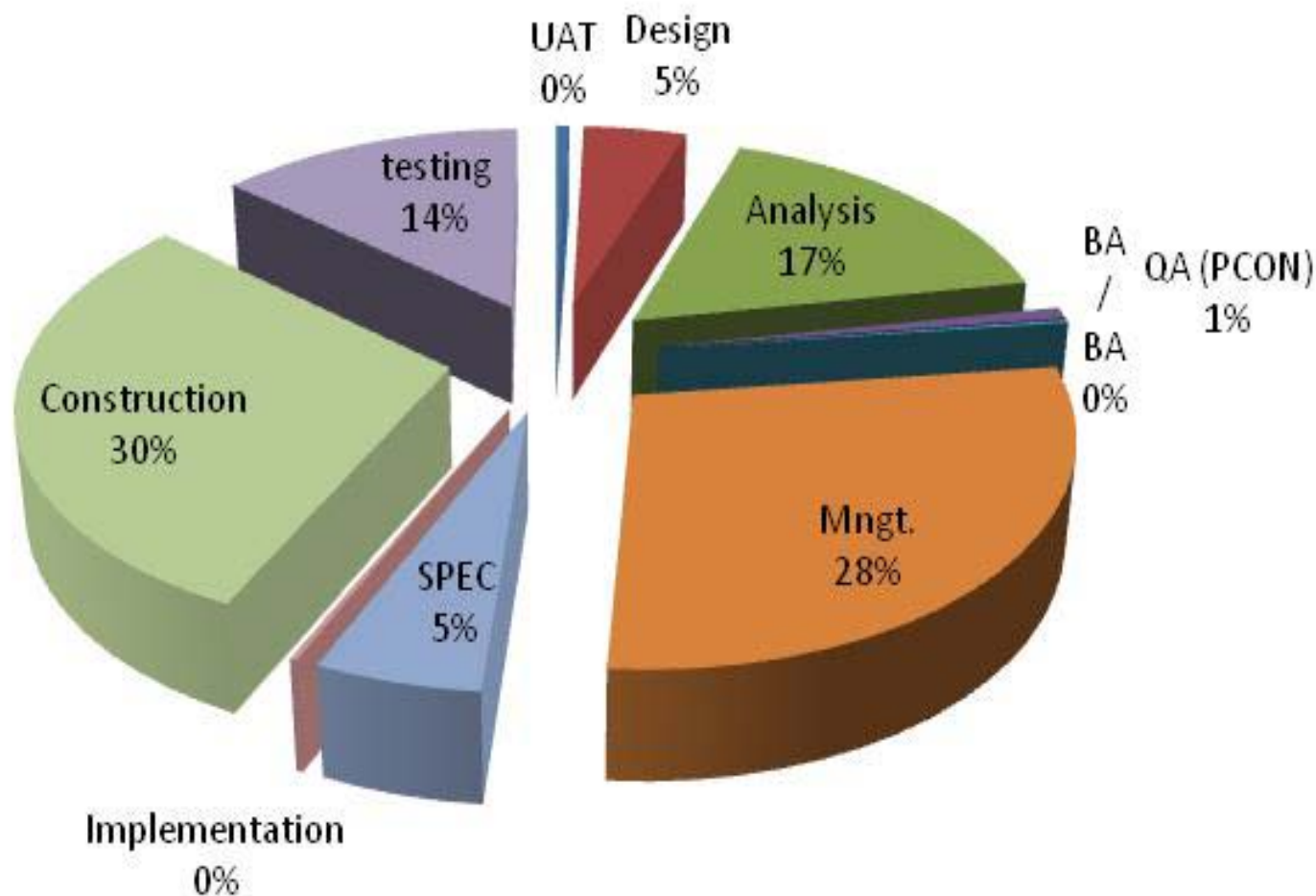
- Give you detailed root cause analysis
- Will not provide silver bullets
- Will not solve your tomorrow problems
 - **But it is practical for next phase**

Initial Effort Planning

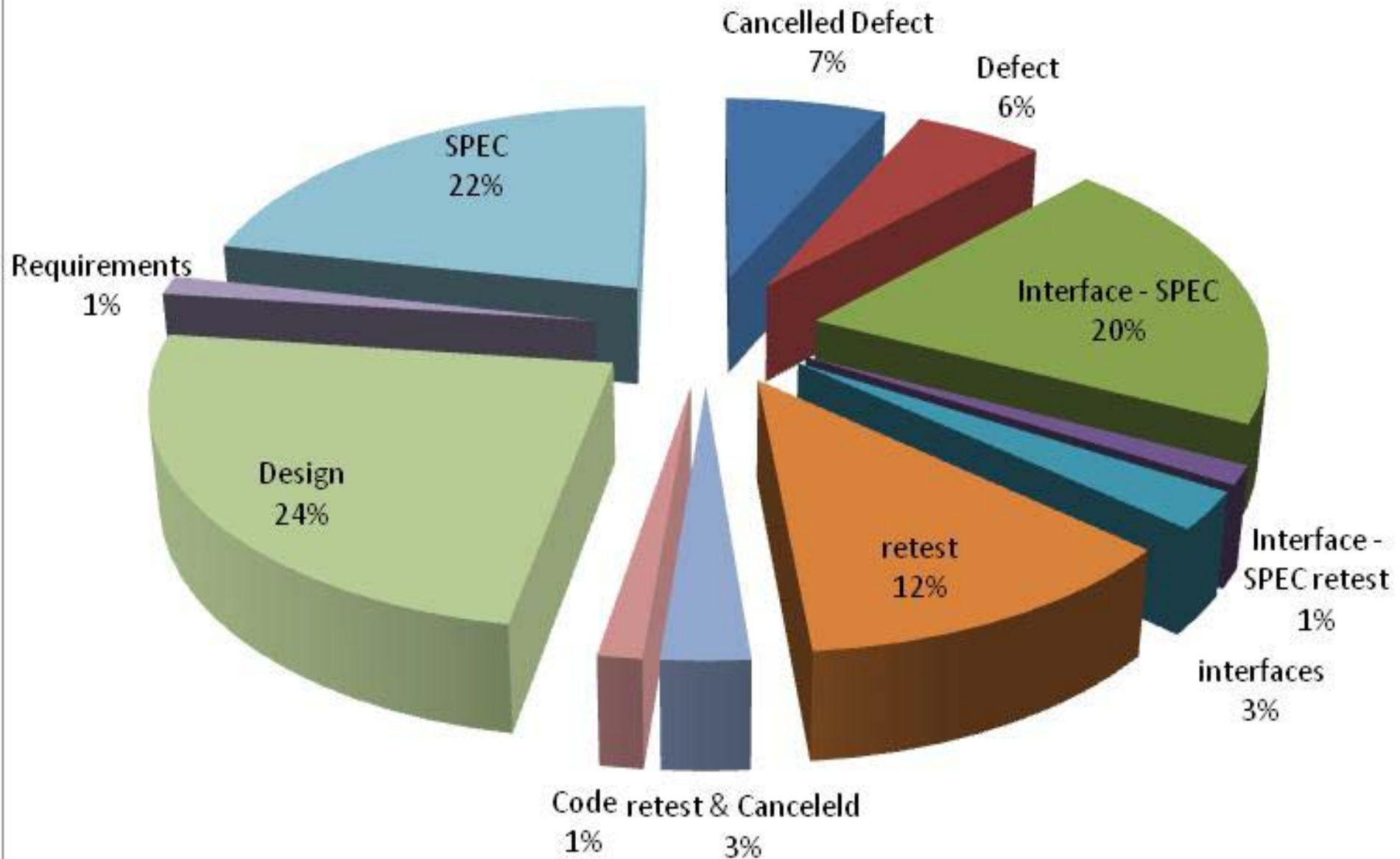


Current Effort Distribution For all Project Phases

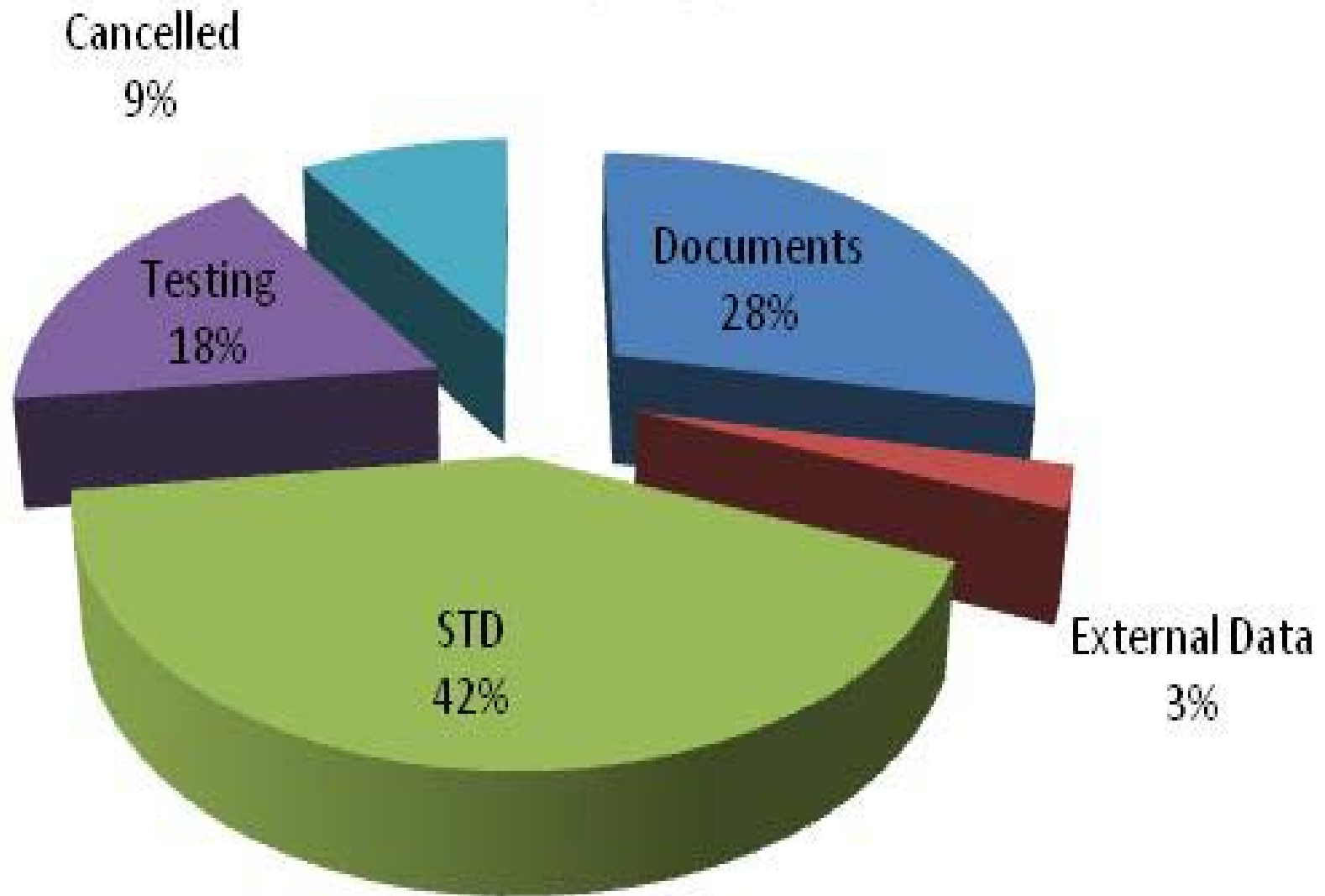
Total Effort

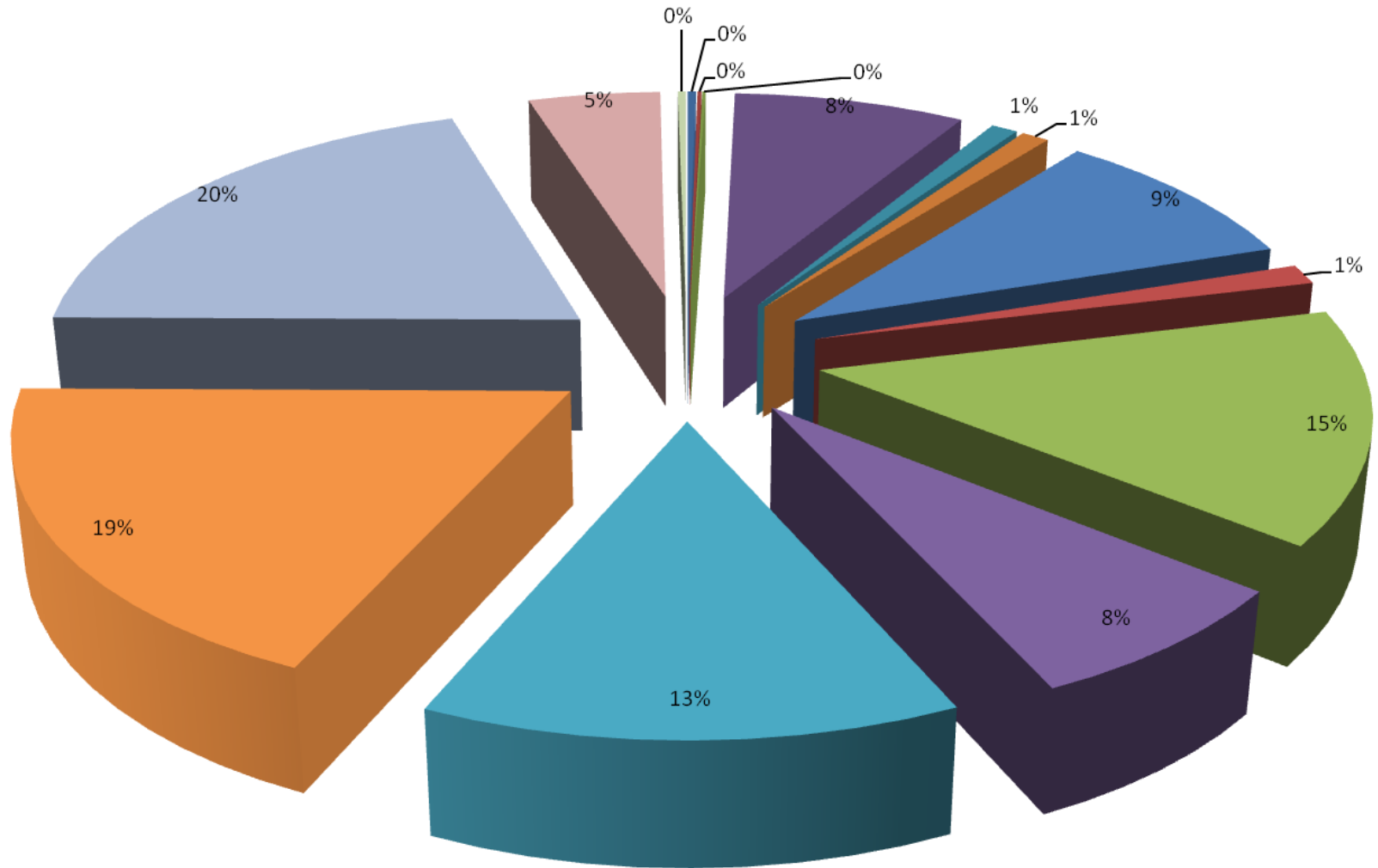


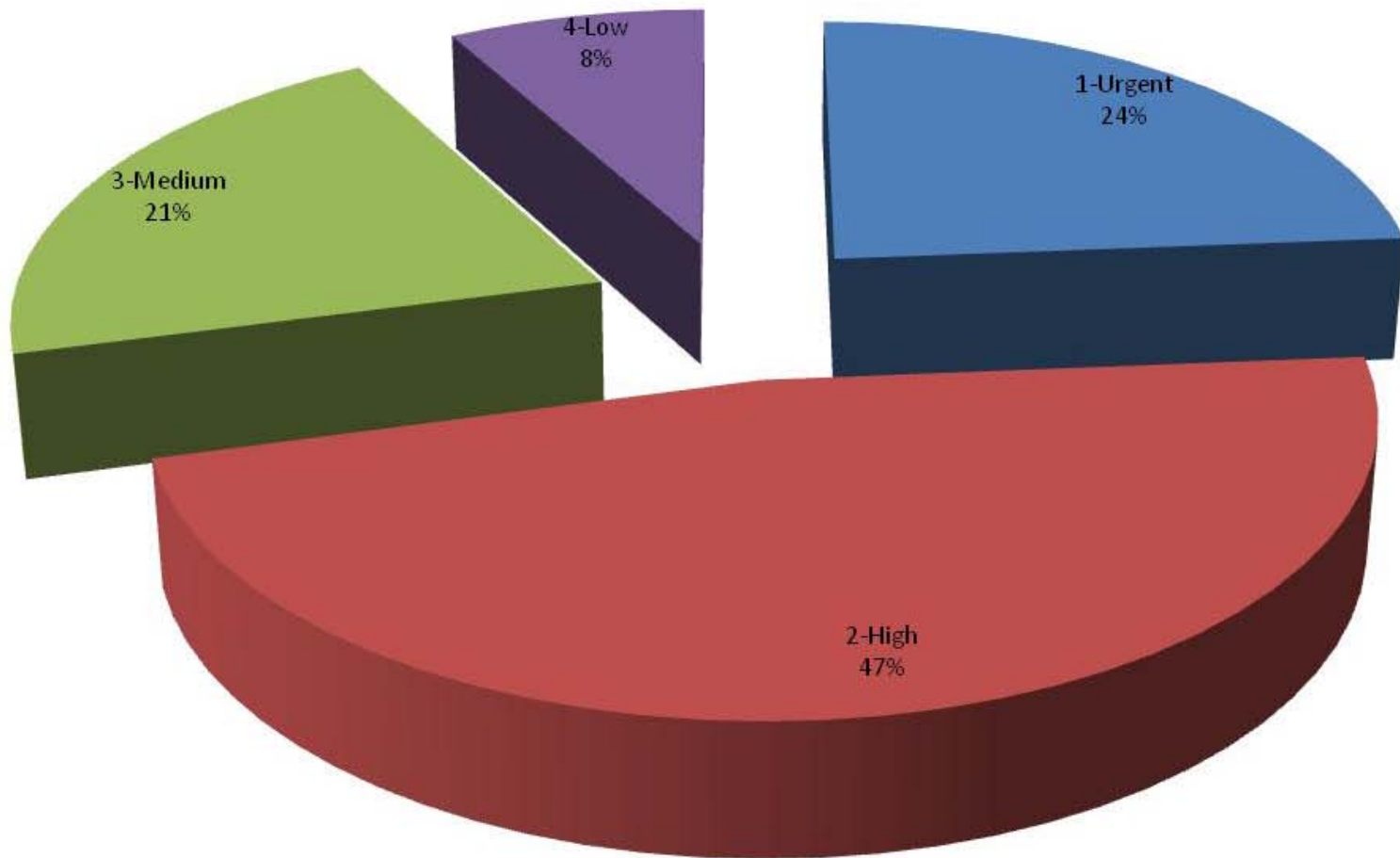
Defects by originator



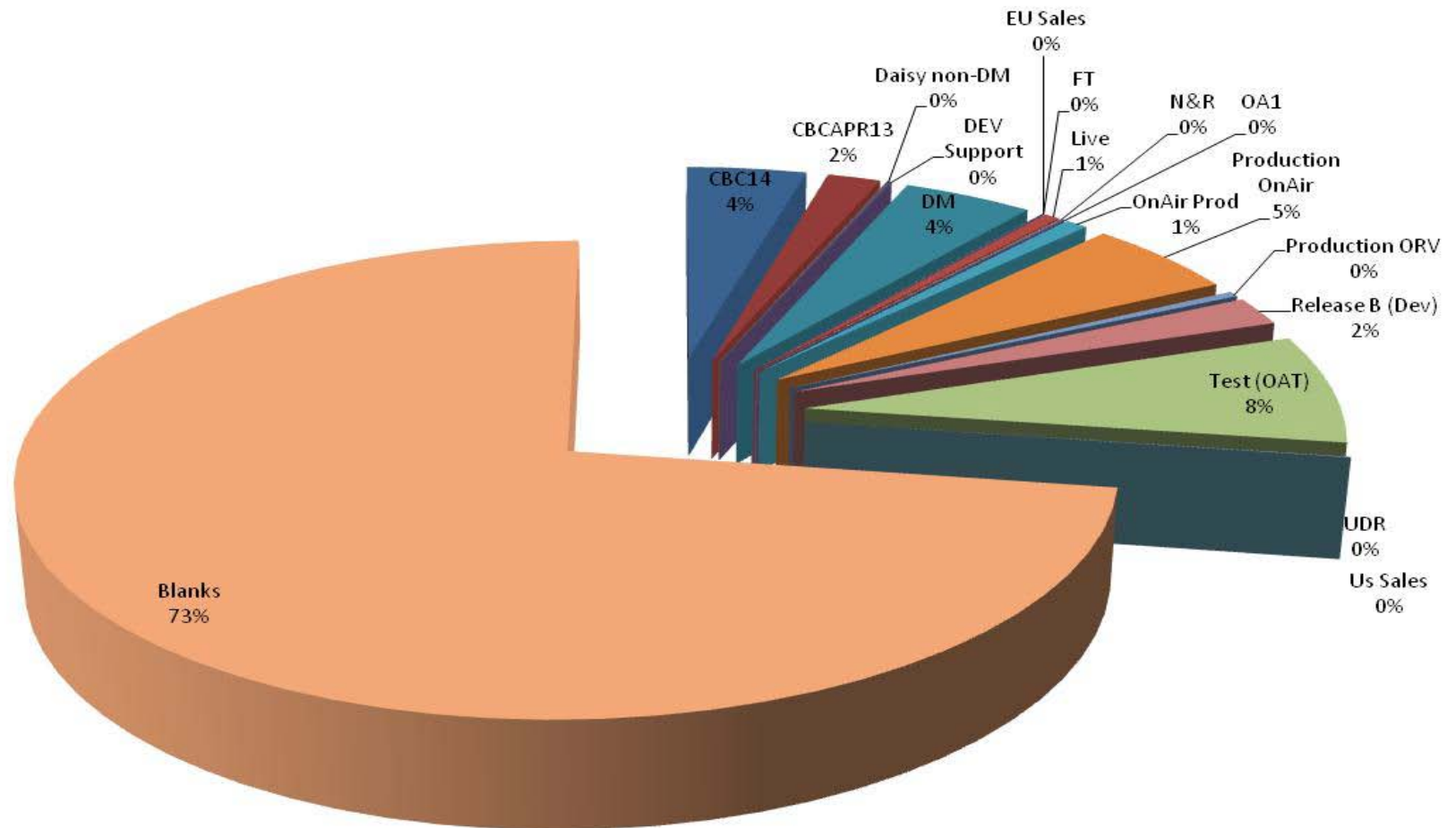
Defects by Type

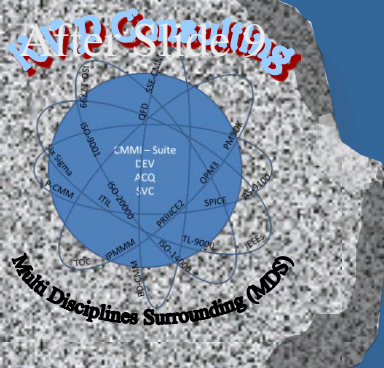




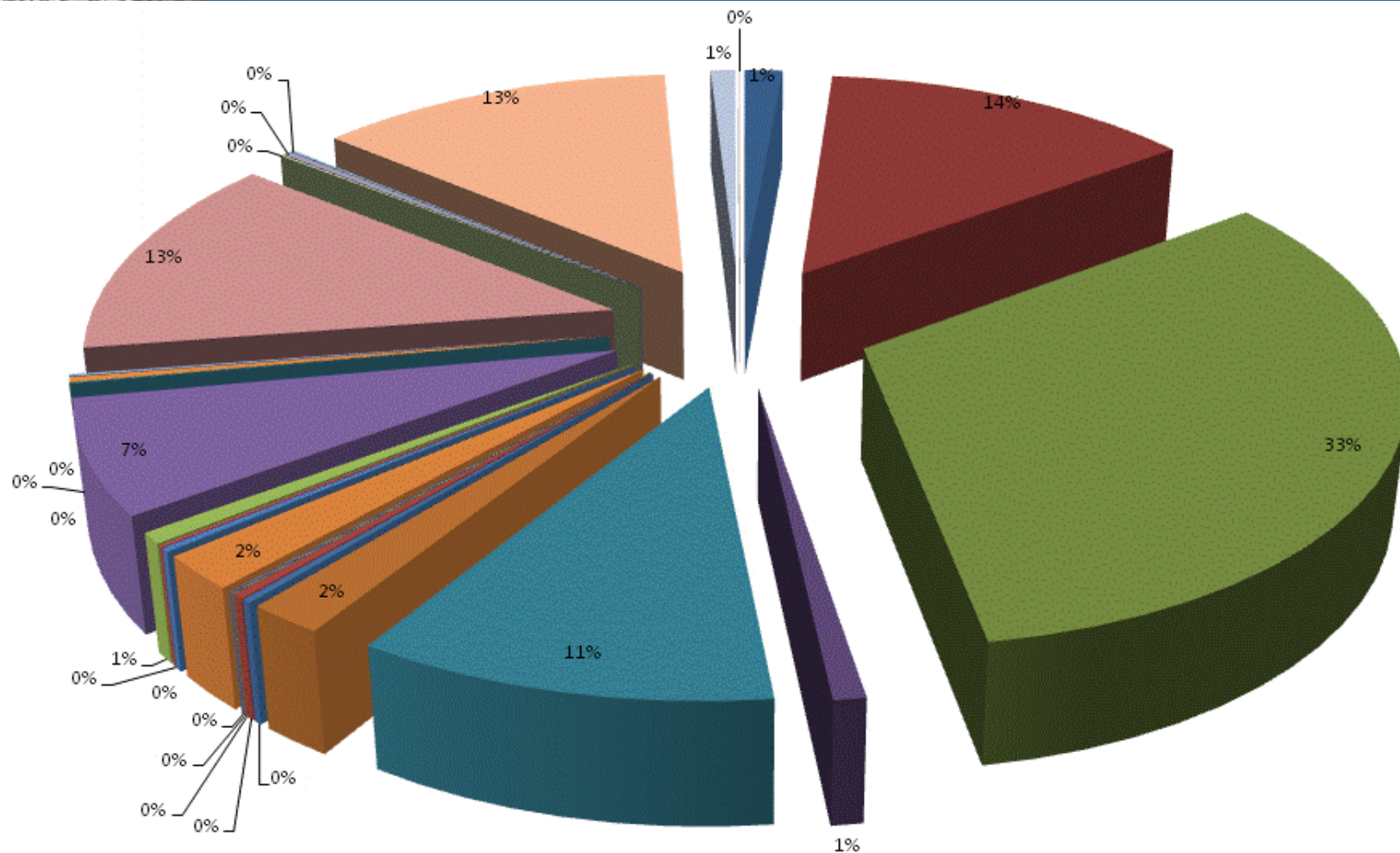


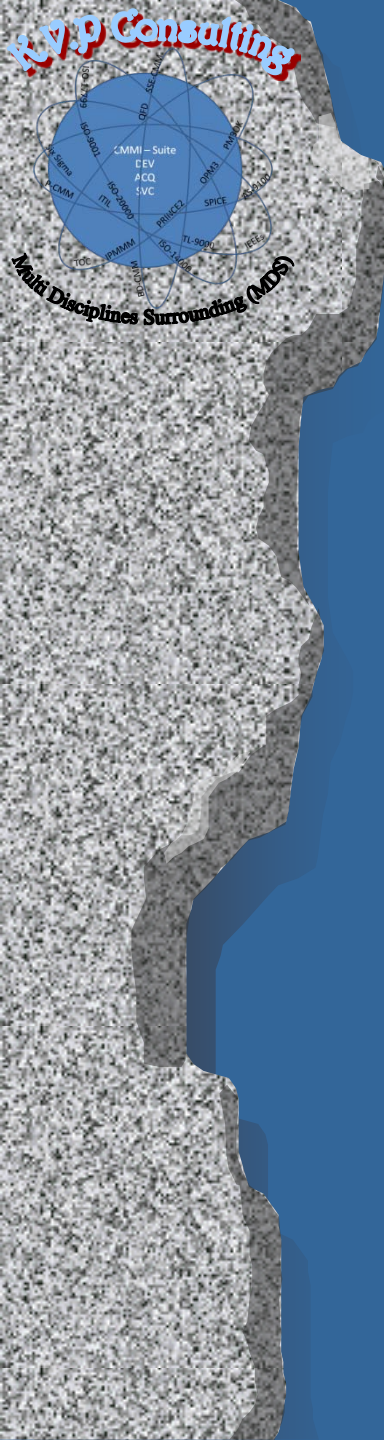
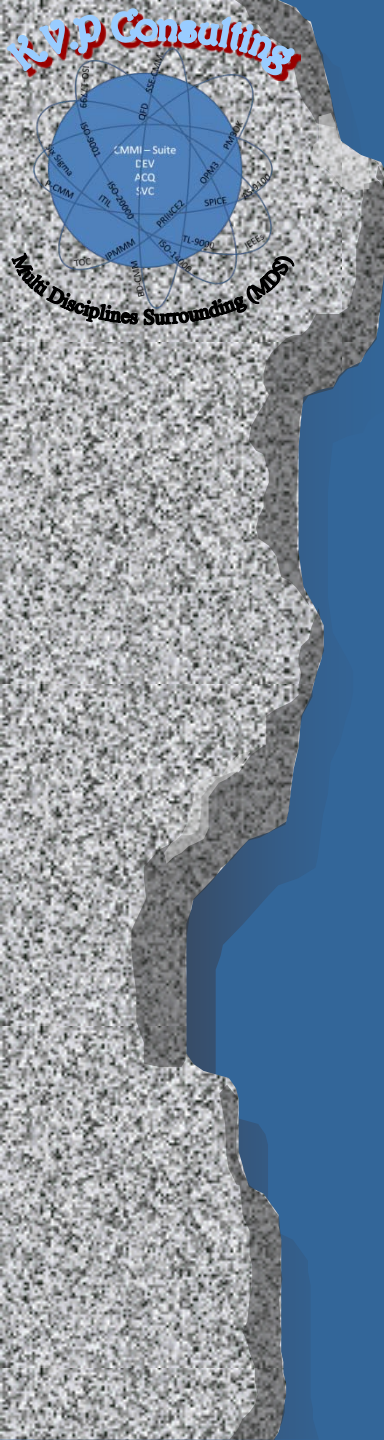
Menu





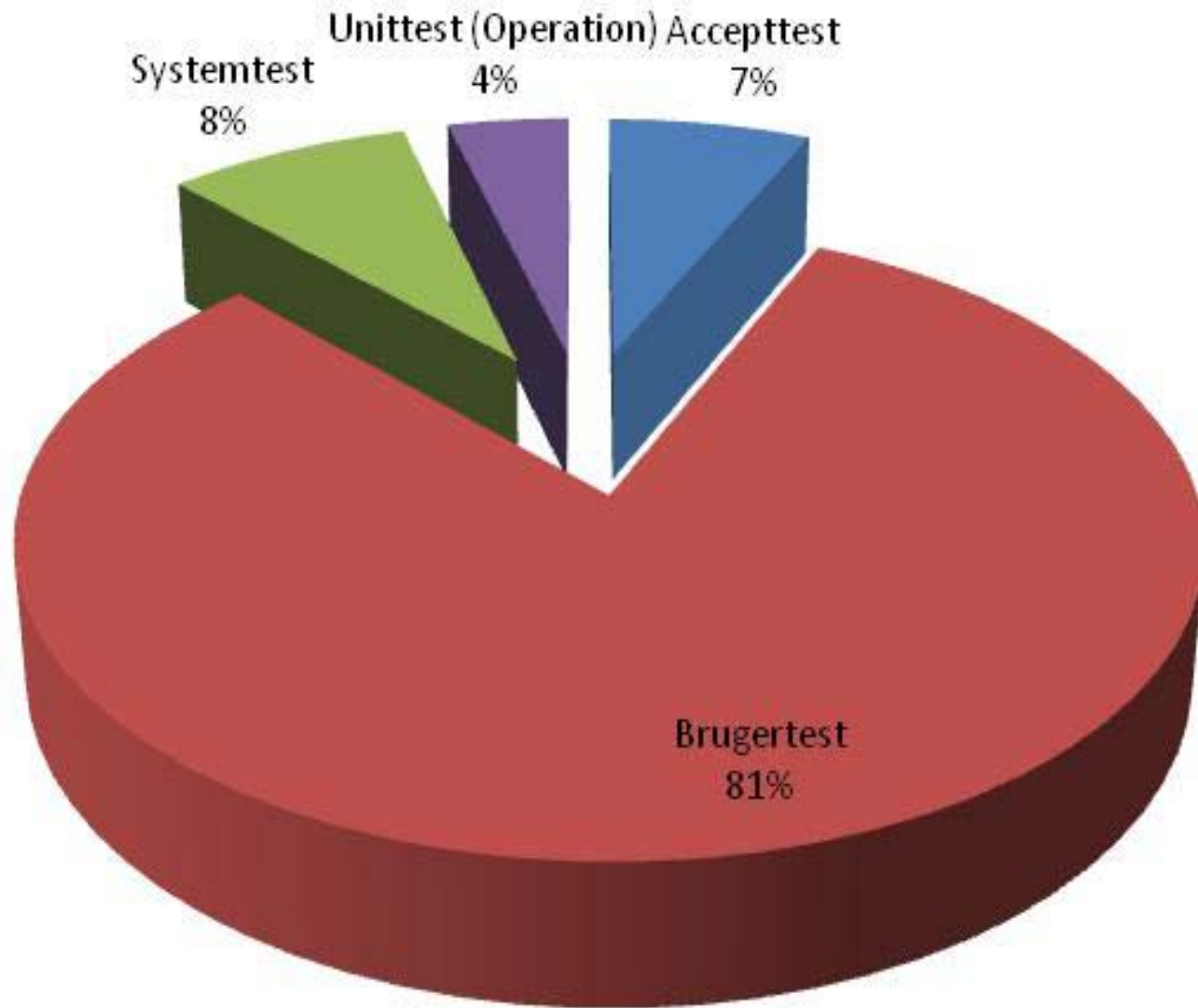
Clients

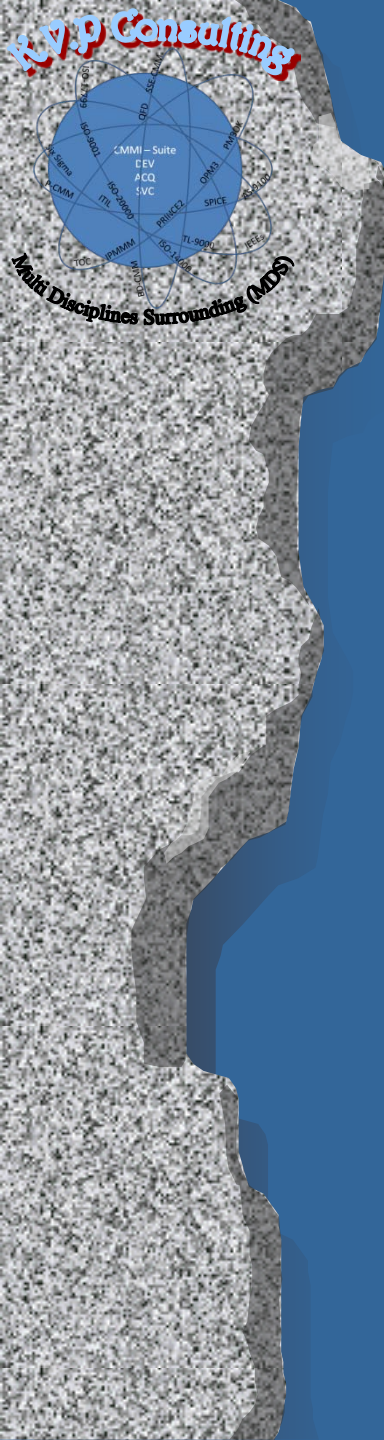




All	LC	%
71	40	56%
693	575	83%
1670	1572	94%
43	24	56%
547	455	83%
102	44	43%
12	1	8%
15	7	47%
1	0	0%
4	1	25%
1	1	100%
112	81	72%
13	6	46%
6	0	0%
36	20	56%
373	231	62%
2	0	0%
15	9	60%
7	4	57%
676	418	62%
5	5	100%
15	7	47%
5	4	80%
661	569	86%
46	34	74%
2	0	0%

Defects by Test Level





Let's Try Some Mix and Match

We Will Demonstrate How Relationships Between Measures Can Benefit the Organization for Better Planning and Management

Dashboard Concept

Lagging

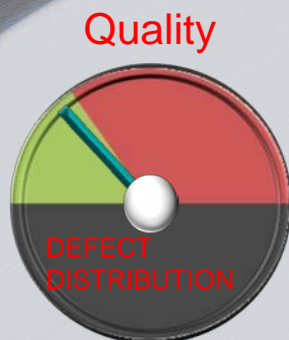


Leading



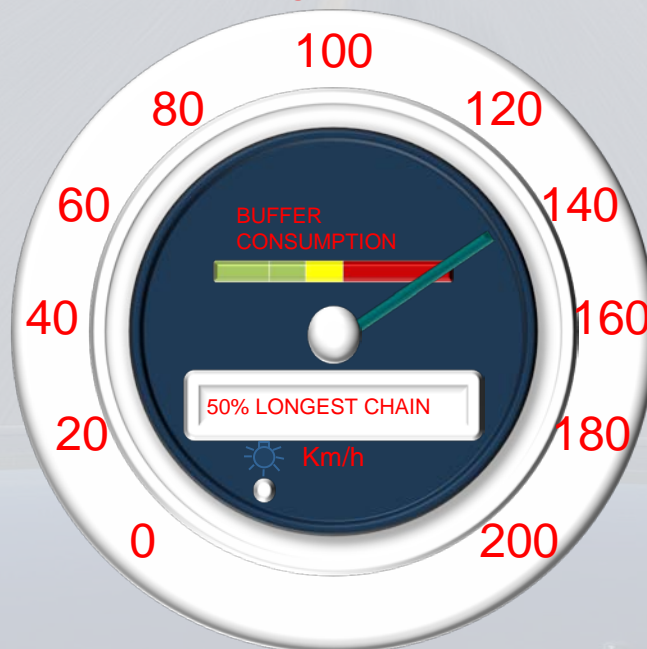
Scope

Management Tool

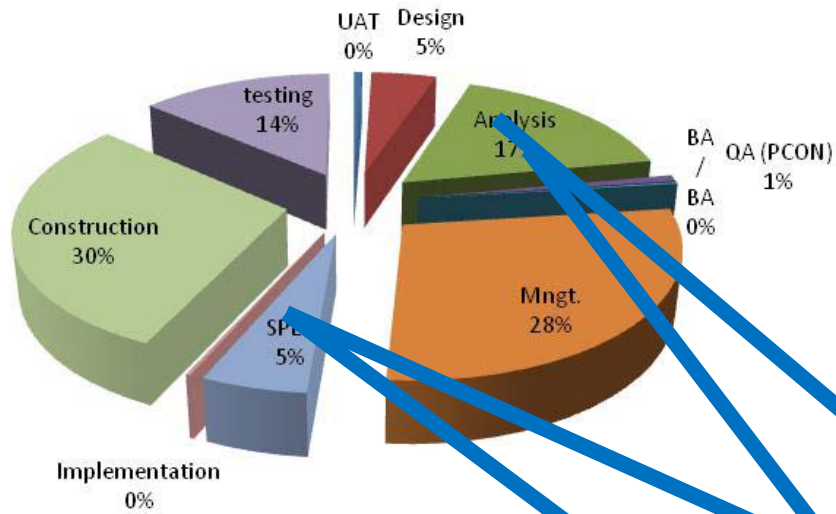


Code inspection coverage

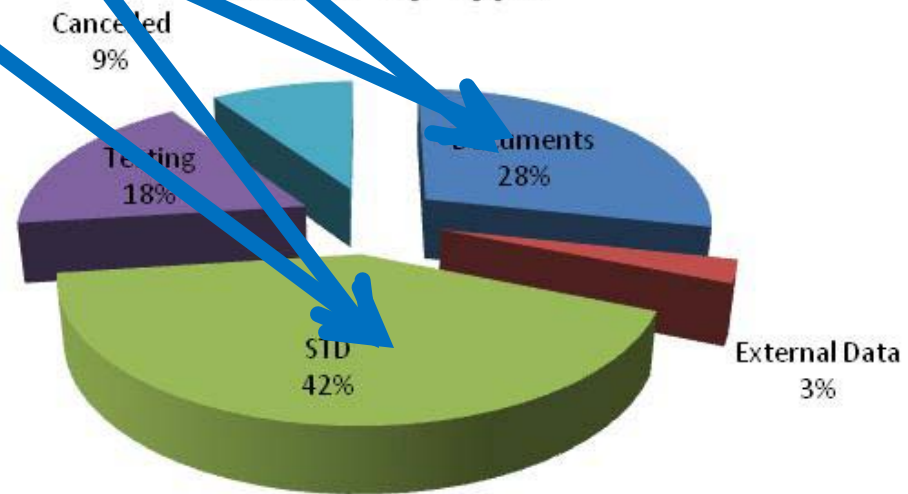
Pass Rate



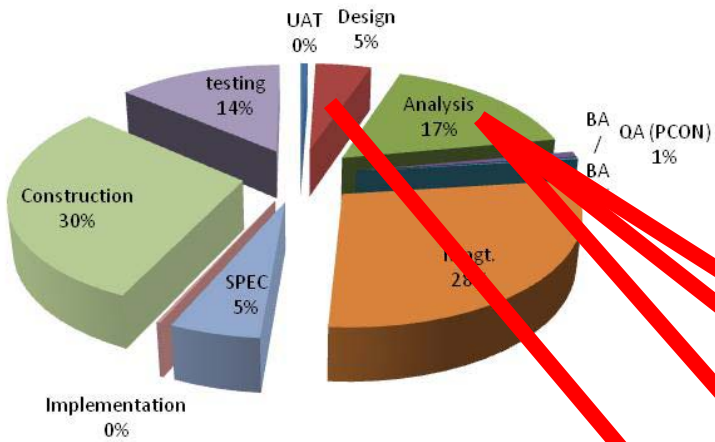
Total Effort



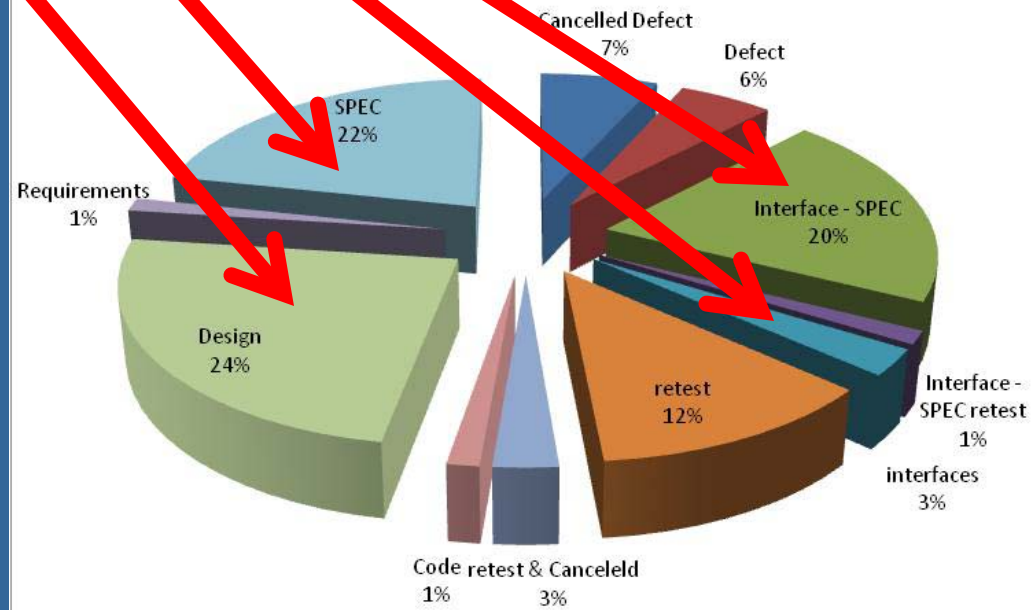
Defects by Type

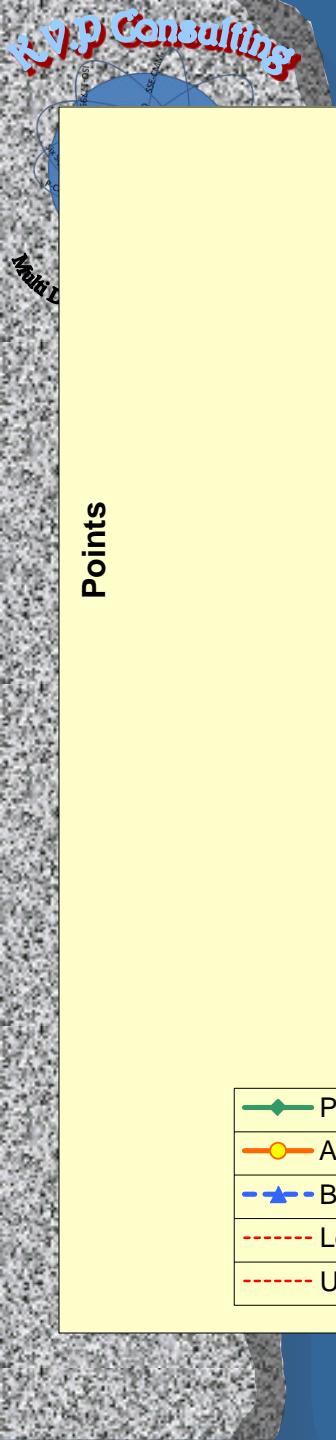


Total Effort



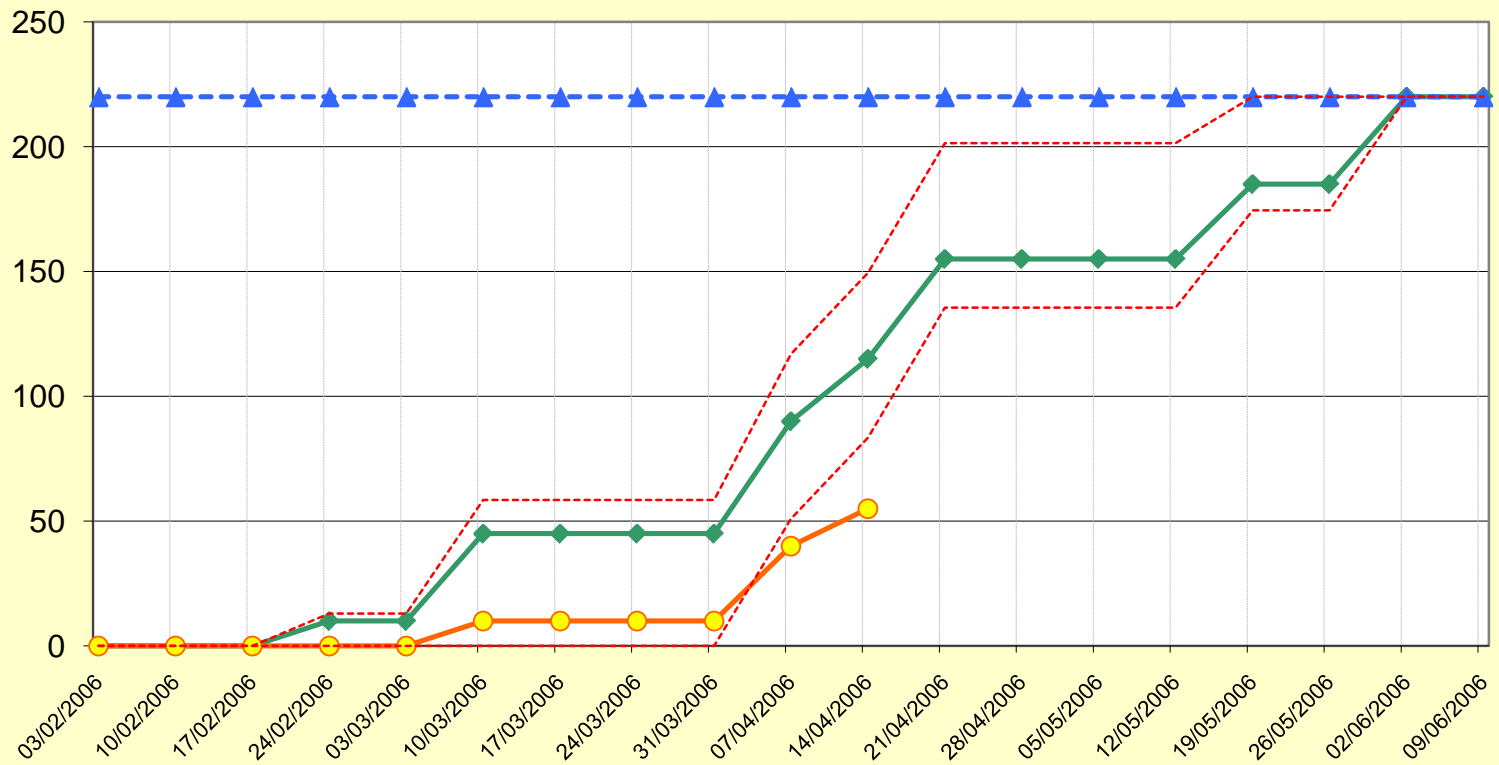
Defects by originator



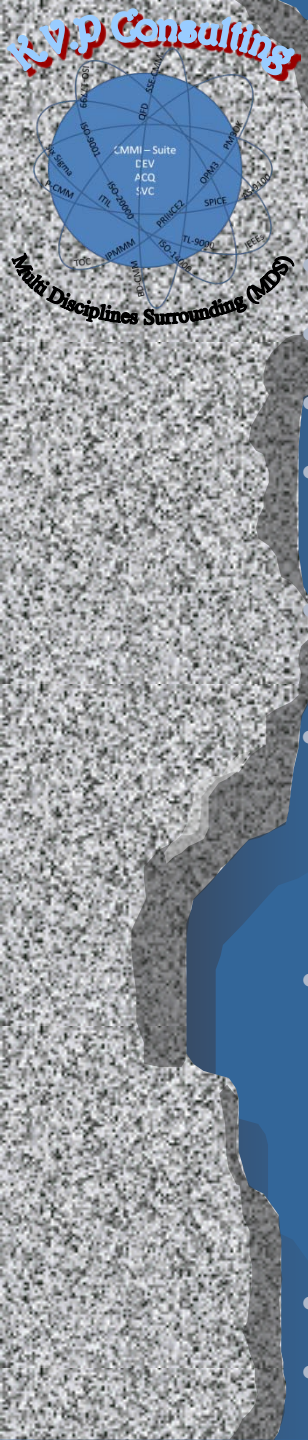


Planned and Actual Completion

Points

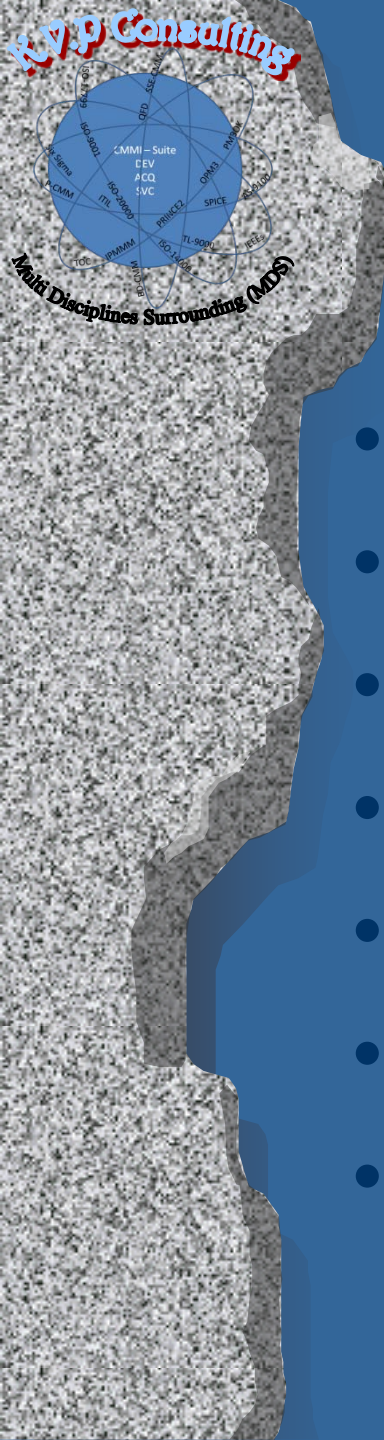


	02/03/06	02/10/06	02/17/06	02/24/06	03/03/06	03/10/06	03/17/06	03/24/06	03/31/06	04/07/06	04/14/06	04/21/06	04/28/06	05/05/06	05/12/06	05/19/06	05/26/06	06/02/06	06/09/06
Plan	0	0	0	10	10	45	45	45	45	90	115	155	155	155	155	185	185	220	220
Actual	0	0	0	0	0	10	10	10	10	40	55								
Baseline	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220
Lower	0	0	0	0	0	0	0	0	0	51	84	136	136	136	136	175	175	220	220
Upper	0	0	0	13	13	59	59	59	59	117	150	202	202	202	202	220	220	220	220



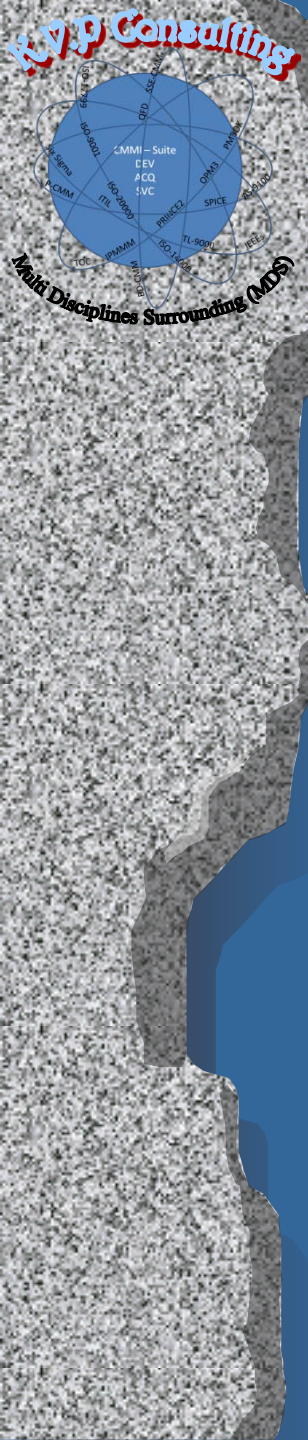
Some guesstimations on cost effectiveness

- ➞ If an average developer **day cost** is ~7000units
- ➞ The total **project effort** was 10022 day (100%)
- ➞ The **testing** phase was 1453 day (14.5%)
- ➞ **Defect** that are the result of **documentation** are 69% of all defects
- ➞ If we will **assume** the **to correct** 69% of all defects will **take around 40%** of the testing duration;
- ➞ means that:
 - that will be **581 day**
 - With the overall **cost of 4068400units**
- ➞ However
 - **Adding 30 review days** in the static tests
 - **and another 80 days of code inspection**
 - will end with the **cost of 770000 units**
- ➞ **And still we have saved at least 9401000 units (1343 days)**
- ➞ **Means that we were able to reduce 13.04% of the project time**



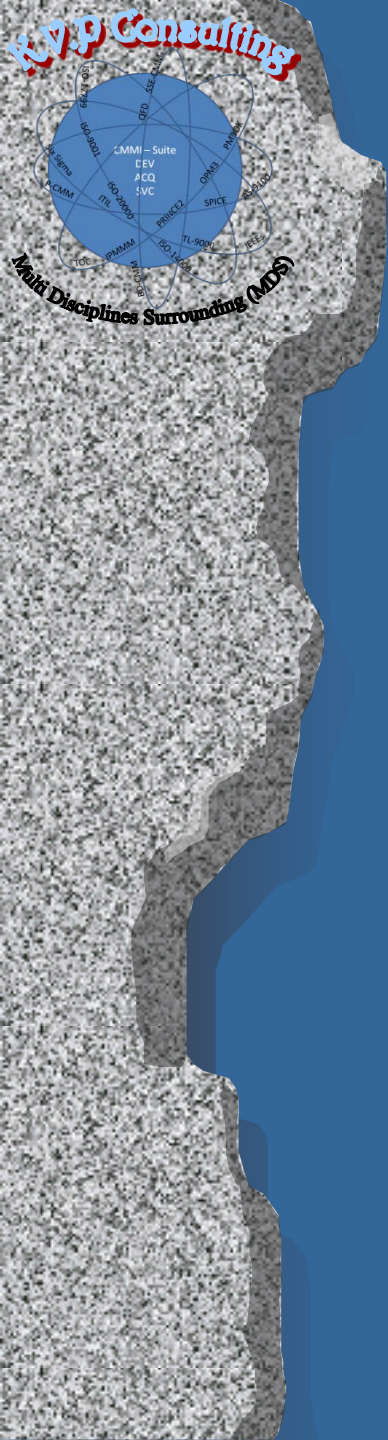
What Organizational Processes we have touch

- Tailoring
- Scope and Size
- Status meetings
- Static Tests
- Testing (planning and execution) all phases
- Lesson learned
- Process Improvement



CMMI Effecting PA's

- Project Planning
- Project Monitor and Control
- Measurement and Analysis
- Validation
- Verification
- Requirements Development
- Technical Solution
- Product Integration
- Organizational Process Focus



Practical Improvements Suggestions

- Requirements Development
 - Writing
 - Verifying
 - Validating
- Effort Distribution
 - Overhead planning
 - Estimation models
 - Project control
 - Lessons learned
- Verification
 - Planning
 - Guidelines for conducting
 - Checklist
 - Results analysis
 - Efficient communication
 - Lessons learned and root causes

PHASE	PERCENT OF EFFORT
Requirements Evaluation Phase	8%
Project Planning Phase	3%
Analysis Phase	10%
Design Phase	20%
Construction Phase	32%
Test Phase	23%
Implementation Phase	1%
Customer Support Phase	2.5%
Completion Phase	.5%

Characteristic	Level	Weightage
Product complexity	High	1.15
Main storage constraints	High	1.06
Applications experience	Low	1.13
Programmer capability	Low	1.17
All other characteristic	Nominal	1.00
Effort Adjustment Factor	$1.15 * 1.06 * 1.13 * 1.17 * 1.00 = 1.61$	

Activity	Small Project	Medium Project	Large Project
User Documentation	10	05	03
Project Management	25	15	10
Quality Assurance	15	10	10
User Training	10	07	02
Acceptance Testing	10	05	05
Performance Tuning	05	08	10
Totals (%age)	75	50	40

IMPERATIVE	OCCURRENCE
shall	0
must	46
is required to	0
are applicable	0
are to	0
responsible for	0
will	18
should	3
TOTAL	67

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NUMBERING STRUCTURE		SPECIFICATION STRUCTURE	
DEPTH	OCCURRENCE	DEPTH	OCCURRENCE
1	2201	1	49
2	81	2	2
3	55	3	14
4	54	4	2
5	0	5	0
6	19	6	0
7	0	7	0
8	0	8	0
9	0	9	0
TOTAL	2410	TOTAL	67

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DIRECTIVE	OCCURRENCE
e.g.	0
i.e.	1
For example	0
Figure	0
Table	0
Note:	0
TOTAL	1

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WEAK PHRASE	OCCURRENCE
adequate	0
as appropriate	0
be able to	0
be capable of	0
capability to	0
effective	0
as required	0
normal	0
provide for	0
timely	0
easy to	0
TOTAL	0

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CONTINUANCE	OCCURRENCE
below:	0
as follows:	0
following:	0
listed:	0
in particular:	0
support:	0
and	2
:	0
TOTAL	2

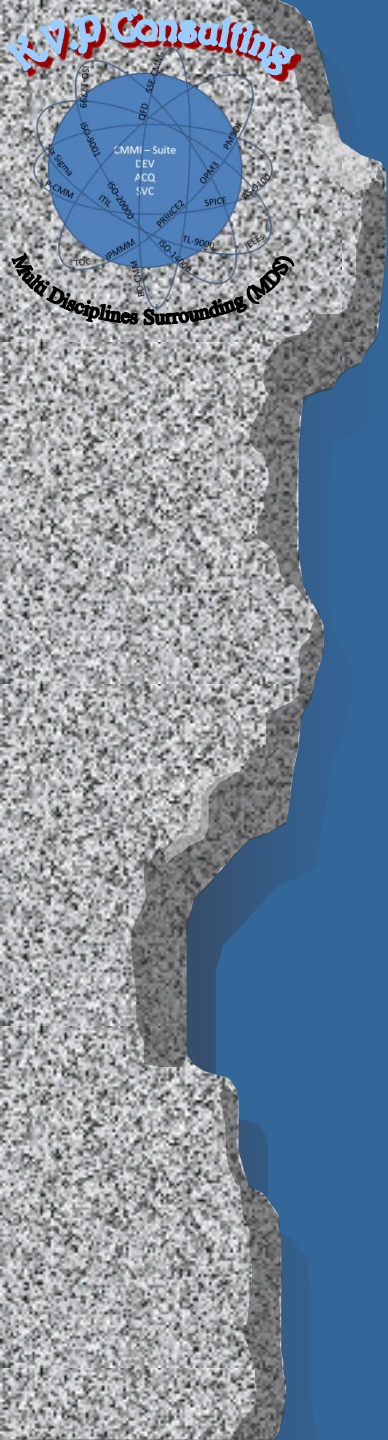
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OPTION PHRASES	OCCURRENCE
can	8
may	16
Optionally	0
TOTAL	24

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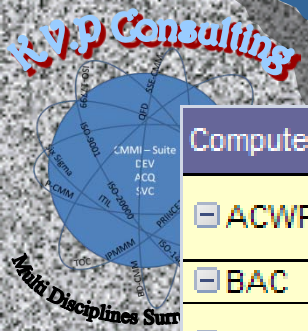
INCOMPLETE	OCCURRENCE
TBD	0
TBS	0
TBE	0
TBC	0
TBR	0
not defined	0
not determined	0
but not limited to	0
as a minimum	0
TOTAL	0

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Practical Improvements Suggestions

- Validation
 - Planning
 - Guidelines for conducting
 - Checklist
 - Results analysis
 - Efficient communication
 - Lessons learned and root causes
- Measurements
 - Definition with direct line to business objectives
 - Measurements structures, content and context
 - Guidelines for collecting and ‘work with’
 - Checklist
 - Results analysis
 - Efficient communication
 - Lessons learned and root causes



Control Measures

Computed Metric Name	Alias	Objective of Computed Metric
ACWP	Actual Cost of Work Performed	Identify the actual labor hours spent on the project to date.
BAC	Budget at Completion	Identify the project's budget.
BCWP	Budgeted Cost of Work Performed	Identify budgeted labor hours associated with the work that has been completed.

Performance Measures

Goal	Question	Metric	Definition	Source	frequency (dev)
Improve productivity	How efficient are tests?	Testing efficiency	Defects detected through testing / hour of testing	DTS	Monthly
	How efficient are reviews?	Review efficiency	Defects detected through reviews / hour of review	DTS	Monthly
	What is the productivity in fixed price projects?	Productivity	(Actual size of the product delivered to the customer / Actual effort spent to complete the project) in each technology platform	PINS (add size field)	End of the project
	How effective is best practices sharing?	KR artifact usage index	KR artifacts used / project	KR	Monthly
		KR artifact contribution index	KR artifact added / project	KR	Monthly



- Improve content of guidelines in the different technical document to build more strong and clear descriptions
- Peer reviews
- ‘Internal’ documentation

- Identify process goals and targets with direct line to business objectives
- Plan to process evaluation; including:
 - Guidelines for conducting
 - Checklist
 - Results analysis
 - Efficient communication
 - Lessons learned and root causes

