Research Article

A Study to Analyze the Impact of Knowledge Management (KM) practices in IT Service Delivery Industry in India

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Abstract: Information Technology (IT) Industry in India is growing fast. Organizations across the world are outsourcing the IT services to take advantage of cost and time differences. India plays vital role in supporting the outsourcing services by taking advantage of the language skills and skilled workforce. Knowledge Management (KM) is critical for the continuity of the services and success of the organisations in different domains. This paper analysis the impact of Knowledge Management in Information Technology (IT) Service Delivery Industry in India. The study reveals Knowledge Management improves the performance of the Service Delivery organization. Methodical implementation and continuous improvement of Knowledge Management practices would further accelerate and improve the customer experience.

Key Words: Knowledge Management, Information Technology, Service Delivery Industry

1. INTRODUCTION

Global business environment becomes increasingly competitive day by day. There is a growing need for service-based organizations to adopt the best practices, tools and methodologies as part of implementation of Information Technology Service Management (ITSM). Information Technology service provider organizations have either implemented or in the process of implementing the Information Technology Infrastructure Library (ITIL) framework to continuously measure and monitor their Information Technology operations to improve service delivery and customer satisfaction. Knowledge Administration is a critical step in Service evolution phase of Information Technology Service Management. While few larger service providers through experience have matured their service management process over the years, many small, medium, and few large organizations still face significant challenges in improving service management processes. Repeatable processes and services could be automated by combining various automation tools available in the market for knowledge management and Information Technology service management.

1.1 Global Information Technology Industry

Recent Market report of Gartner says that the spending of entire international IT sector that include IT solutions, data center systems, business applications and telecom providers is likely to exceed $3.7 trillion during 2019, which shows an improvement of 4.5% over 2018. This growth in international IT sector started in 2018 and is expected to grow in the future too.

Today the greatest and fastest growing segment in the International IT sector is the Internet of Things (IoT). It has grown at an astonishing rate of 30 % within a five-year span from $ 700 million in 2016 and is expected to be over $ 2 billion by 2021.

1.2 Information Technology Industry in India

Information Technology in India is growing at a rapid pace. It comprises of two components namely - IT services and business process outsourcing (BPO). The sector has gone from contributing 1.2% to India's GDP in 1998 to 7.7% in 2017. Based on the data released by NASSCOM, the sector aggregated revenues of US$180 billion in 2019 growing by over 13%. The export revenue was recorded at US$99 billion and domestic revenue at US$48 billion. As of 2020, more than 4.36 million employees were accounted as India's IT workforce. United States is the largest employer accounting for about two-thirds of India's IT service exports.

1.3 IT Service Delivery

IT Service Delivery refers to the way in which an organisation provides users access to IT services that include Infrastructure, Applications, data storage and other business resources. They cover design, development,

deployment, operation and retirement. These stages of service delivery are executed by IT professionals. Quality of IT service delivery is evaluated by metrics that are include in the service level agreement (SLA).

1.4 Knowledge Management

Knowledge management is the conscious process of defining, structuring, retaining and sharing the knowledge and experience of employees within an organization. The main goal of knowledge management is to improve an organization's efficiency and save knowledge within the company. Successful knowledge management will improve an organization in several ways. It will ensure that the specialized Knowledge of employees does not leave with them or go unutilized by other employees who would benefit from that knowledge. It allows for better situational awareness, as well as opening doors for learning about best practices, lessons learned, and overall organizational improvement.

1.5 Knowledge Management in India

Knowledge Management is a relatively new but a fast emerging concept in India. It promotes integrated approach to identifying, managing and sharing information assets of an organization. The information assets may include but are not restricted to databases, documents, policies, procedures and also expertise in employees.

1.6 Knowledge Management in Organisations

Organizations rely heavily on the Knowledge to support the business. Advances in technology, innovations and policies are practically every day evolving globally. Knowledge management (KM) is a serious and vibrant structural resource that helps in the global competitive business environment to reach competence, effectiveness and viable gain. In the new Digital Evolution Information Technology (IT) is a key driver of many business function. Knowledge Management is a key component of service management which plays the major role.

2. OBJECTIVE

A Study to analyze the impact of Knowledge Management (KM) practices in IT Service Delivery Industry in India. Large IT organizations with minimum of 50,000 employees and having offices in multiple locations providing 10+ years of service in India are considered for the study.

3. METHODOLOGY

We have used both primary and secondary data for this study. The primary data was gathered from stakeholders as part of weekly service delivery review meetings observations. Primary qualitative data was collected through observation due to time limitation and to minimize the cost of data collection. The secondary quantitative data was gathered from Service Now IT Service Management Configuration Management Data Base (CMDB). The category of Organizations taken for study are IT service delivery companies operating out of India. Most of the large IT service companies in India having more than 10 years with minimum of 50,000 employees and having offices in multiple locations in India are considered for the study. Research is being done as a part time basis, availability of researcher time, cost and efforts are limitations.

4. ANALYSIS

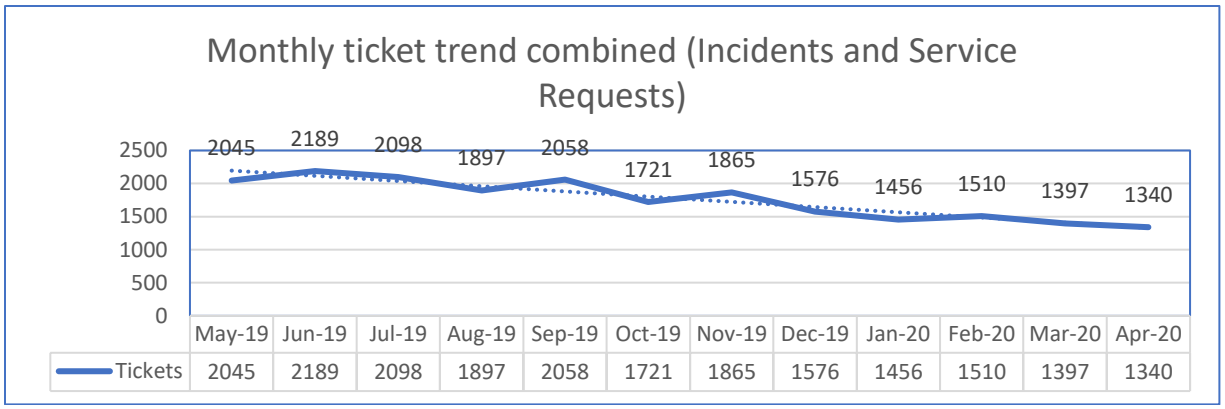
We have considered IT organizations having more than 50000 employees and operating out of multiple locations in India. Considering the time, efforts and cost, we have selected one IT organization for this study.We have taken 12 months primary and secondary ticket data for the analysis. The data categories contain both incident and Service request tickets. The KM implementation started prior to data analysis period and improvements have been continuously implemented on ongoing basis.

The below table-1 and graph-1 gives an overall monthly combined ticket trend for Incidents and Service requests serviced by the organization. The overall ticket volume is in decreasing trend due to KM implementation.

Table-1: Monthly ticket trend combined (Incidents and Service Requests)

Month	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	Grand Total
Tickets	2045	2189	2098	1897	2058	1721	1865	1576	1456	1510	1397	1340	21152

Graph -1:Monthly ticket trend combined (Incidents and Service Requests)

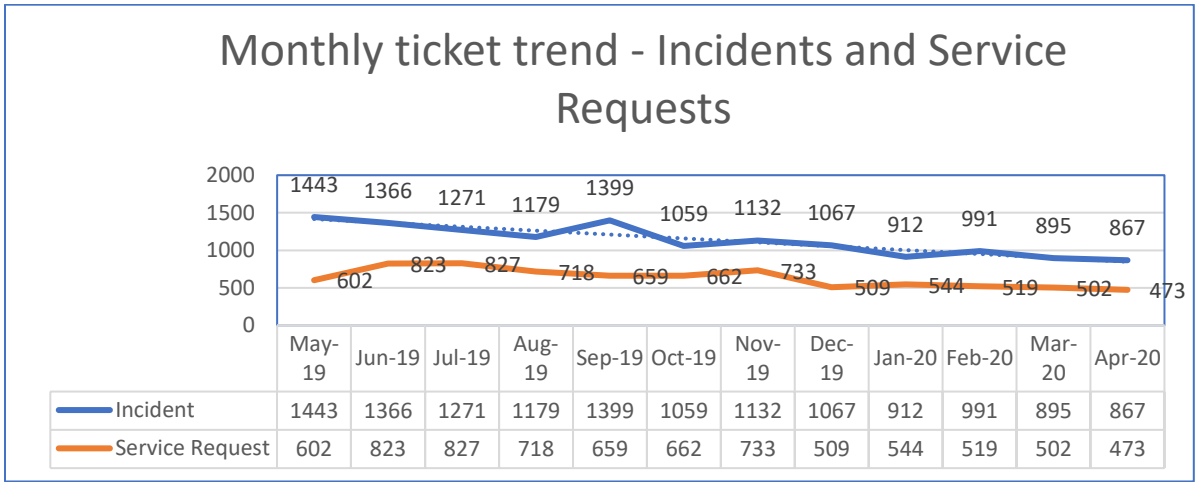


The below table-2 and graph-2 gives monthly ticket trend for Incidents and Service requests serviced by the organization. The overall ticket volume is in decreasing trend for both Incident and Service request. The incident is contributing to 64% of overall volume and service request is contributing to 36% of overall volume.

Table -2:Monthly ticket trend - Incidents and Service Requests

Month	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	Grand Total
Incident	1443	1366	1271	1179	1399	1059	1132	1067	912	991	895	867	13581
Service Request	602	823	827	718	659	662	733	509	544	519	502	473	7571
Grand Total	2045	2189	2098	1897	2058	1721	1865	1576	1456	1510	1397	1340	21152

Graph-2: Monthly ticket trend - Incidents and Service Requests

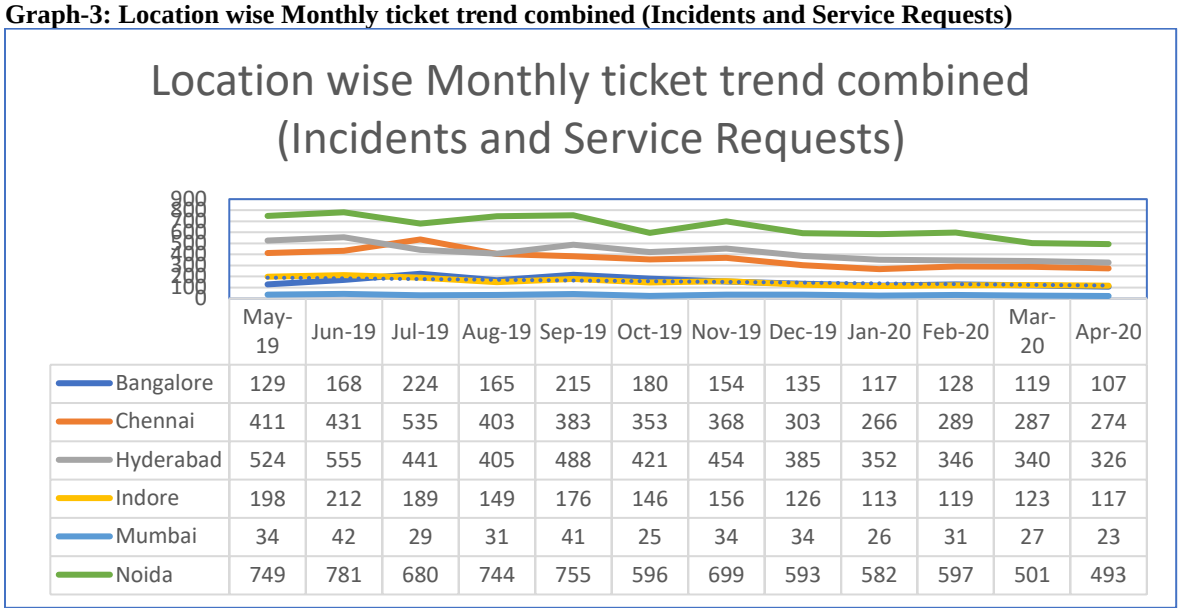


The below table-3 and graph-3 gives an overall monthly combined ticket trend for Incidents and Service requests serviced by the organization by location. The volume contribution from Bangalore is 9%, Chennai is 20%, Hydrabad is 24%, Indore is 9%, Mumbai is 2% and Noida is 37%.

Table -3:Location wise Monthly ticket trend combined (Incidents and Service Requests)

Month	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	Grand Total
Bangalore	129	168	224	165	215	180	154	135	117	128	119	107	1841
Chennai	411	431	535	403	383	353	368	303	266	289	287	274	4303
Hyderabad	524	555	441	405	488	421	454	385	352	346	340	326	5037
Indore	198	212	189	149	176	146	156	126	113	119	123	117	1824
Mumbai	34	42	29	31	41	25	34	34	26	31	27	23	377
Noida	749	781	680	744	755	596	699	593	582	597	501	493	7770
Grand Total	2045	2189	2098	1897	2058	1721	1865	1576	1456	1510	1397	1340	21152

Graph-3: Location wise Monthly ticket trend combined (Incidents and Service Requests)

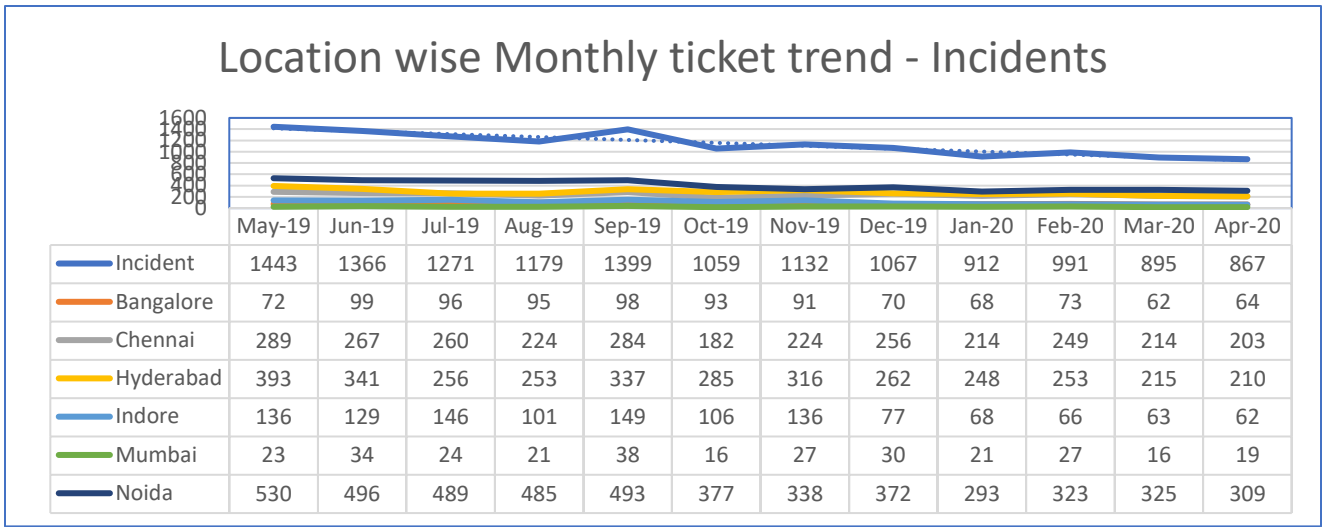


The below table-4 and graph-4 gives monthly ticket trend for Incidents serviced by the organization by location. The volume contribution from Bangalore is 7%, Chennai is 21%, Hydrabad is 25%, Indore is 9%, Mumbai is 2% and Noida is 36%.

Table -4: Location wise Monthly ticket trend – Incidents

Month	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	Grand Total
Incident	1443	1366	1271	1179	1399	1059	1132	1067	912	991	895	867	13581
Bangalore	72	99	96	95	98	93	91	70	68	73	62	64	981
Chennai	289	267	260	224	284	182	224	256	214	249	214	203	2866
Hyderabad	393	341	256	253	337	285	316	262	248	253	215	210	3369
Indore	136	129	146	101	149	106	136	77	68	66	63	62	1239
Mumbai	23	34	24	21	38	16	27	30	21	27	16	19	296
Noida	530	496	489	485	493	377	338	372	293	323	325	309	4830

Graph-4: Location wise Monthly ticket trend - Incidents



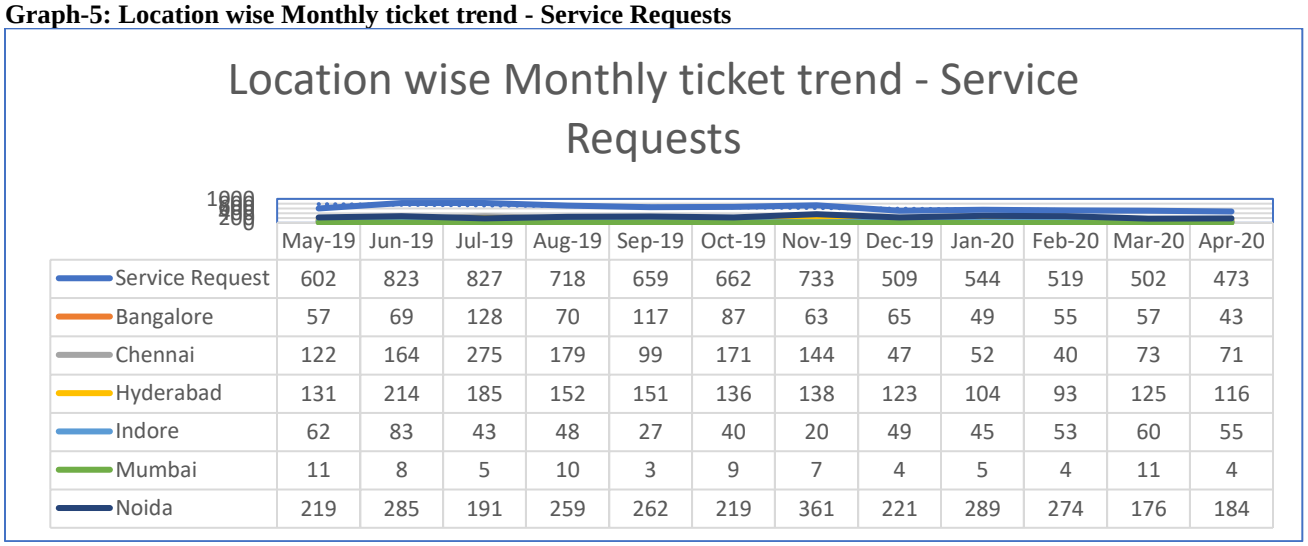
	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20
Incident	1443	1366	1271	1179	1399	1059	1132	1067	912	991	895	867
Bangalore	72	99	96	95	98	93	91	70	68	73	62	64
Chennai	289	267	260	224	284	182	224	256	214	249	214	203
Hyderabad	393	341	256	253	337	285	316	262	248	253	215	210
Indore	136	129	146	101	149	106	136	77	68	66	63	62
Mumbai	23	34	24	21	38	16	27	30	21	27	16	19
Noida	530	496	489	485	493	377	338	372	293	323	325	309

The below table-5 and graph-5 gives monthly ticket trend for Service request serviced by the organization by location. The volume contribution from Bangalore is 11%, Chennai is 19%, Hydrabad is 22%, Indore is 8%, Mumbai is 1% and Noida is 39%.

Table -5: Location wise Monthly ticket trend - Service Requests

Month	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	Grand Total
Service Request	602	823	827	718	659	662	733	509	544	519	502	473	7571
Bangalore	57	69	128	70	117	87	63	65	49	55	57	43	860
Chennai	122	164	275	179	99	171	144	47	52	40	73	71	1437
Hyderabad	131	214	185	152	151	136	138	123	104	93	125	116	1668
Indore	62	83	43	48	27	40	20	49	45	53	60	55	585
Mumbai	11	8	5	10	3	9	7	4	5	4	11	4	81
Noida	219	285	191	259	262	219	361	221	289	274	176	184	2940

Graph-5: Location wise Monthly ticket trend - Service Requests



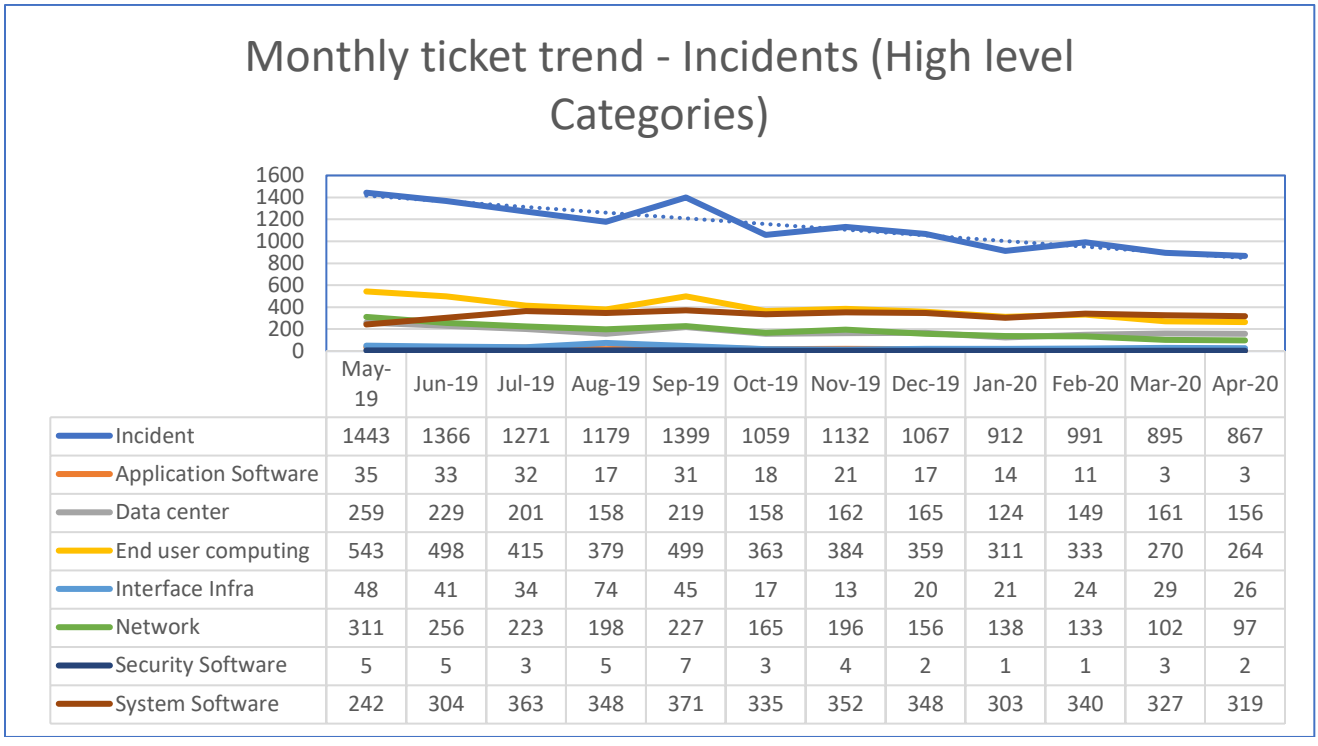
	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20
Service Request	602	823	827	718	659	662	733	509	544	519	502	473
Bangalore	57	69	128	70	117	87	63	65	49	55	57	43
Chennai	122	164	275	179	99	171	144	47	52	40	73	71
Hyderabad	131	214	185	152	151	136	138	123	104	93	125	116
Indore	62	83	43	48	27	40	20	49	45	53	60	55
Mumbai	11	8	5	10	3	9	7	4	5	4	11	4
Noida	219	285	191	259	262	219	361	221	289	274	176	184

The below table-6 and graph-6 gives monthly ticket trend for Incidents -High level categories serviced by the organization. The volume contribution for Application software is 2%, Data center is 15%, End user computing is 32.5%, Interface Infra is 3%, Network is 14%, Security Software is 0.5% and System Software is 33%.

Table -6: Monthly ticket trend - Incidents (High level Categories)

Month	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	Grand Total
Incident	1443	1366	1271	1179	1399	1059	1132	1067	912	991	895	867	11450
Application Software	35	33	32	17	31	18	21	17	14	11	3	3	192
Data center	259	229	201	158	219	158	162	165	124	149	161	156	1710
End user computing	543	498	415	379	499	363	384	359	311	333	270	264	3735
Interface Infra	48	41	34	74	45	17	13	20	21	24	29	26	314
Network	311	256	223	198	227	165	196	156	138	133	102	97	1631
Security Software	5	5	3	5	7	3	4	2	1	1	3	2	42
System Software	242	304	363	348	371	335	352	348	303	340	327	319	3826

Graph-6: Monthly ticket trend - Incidents (High level Categories)

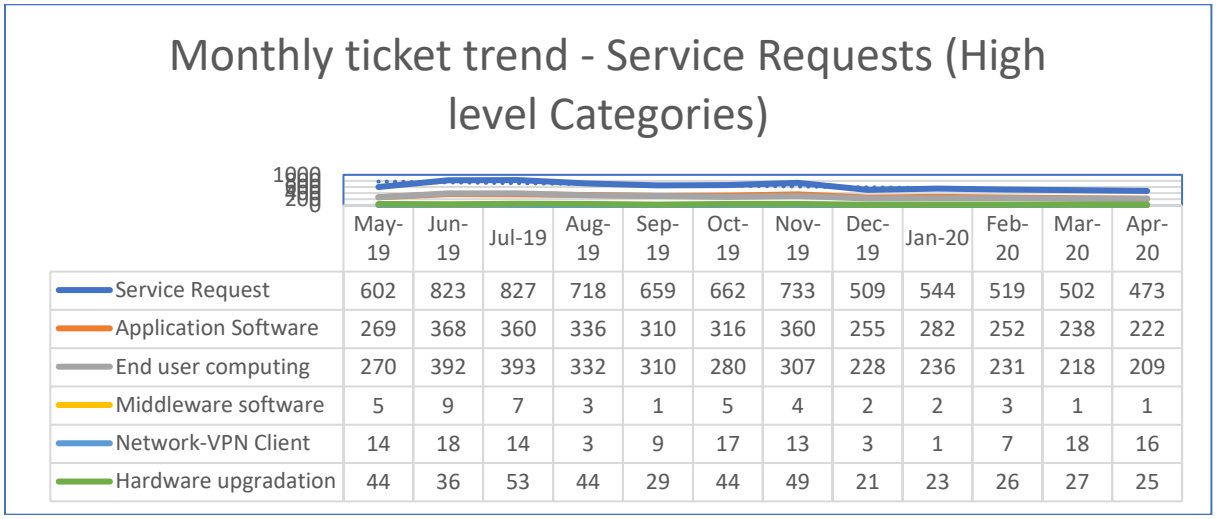


The below table-7 and graph-7 gives monthly ticket trend for Service request - High level categories serviced by the organization. The volume contribution for Application software is 47%, End user computing is 45%, Middleware software is 1.%,Network-Vpn Client is 2% and Hardware upgradation is 5%.

Table –7: Monthly ticket trend - Service Requests (High level Categories)

Month	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	Grand Total
Service Request	602	823	827	718	659	662	733	509	544	519	502	473	7571
Application Software	269	368	360	336	310	316	360	255	282	252	238	222	3568
End user computing	270	392	393	332	310	280	307	228	236	231	218	209	3406
Middleware software	5	9	7	3	1	5	4	2	2	3	1	1	43
Network-VPN Client	14	18	14	3	9	17	13	3	1	7	18	16	133
Hardware upgradation	44	36	53	44	29	44	49	21	23	26	27	25	421

Graph-7: Monthly ticket trend - Service Requests (High level Categories)

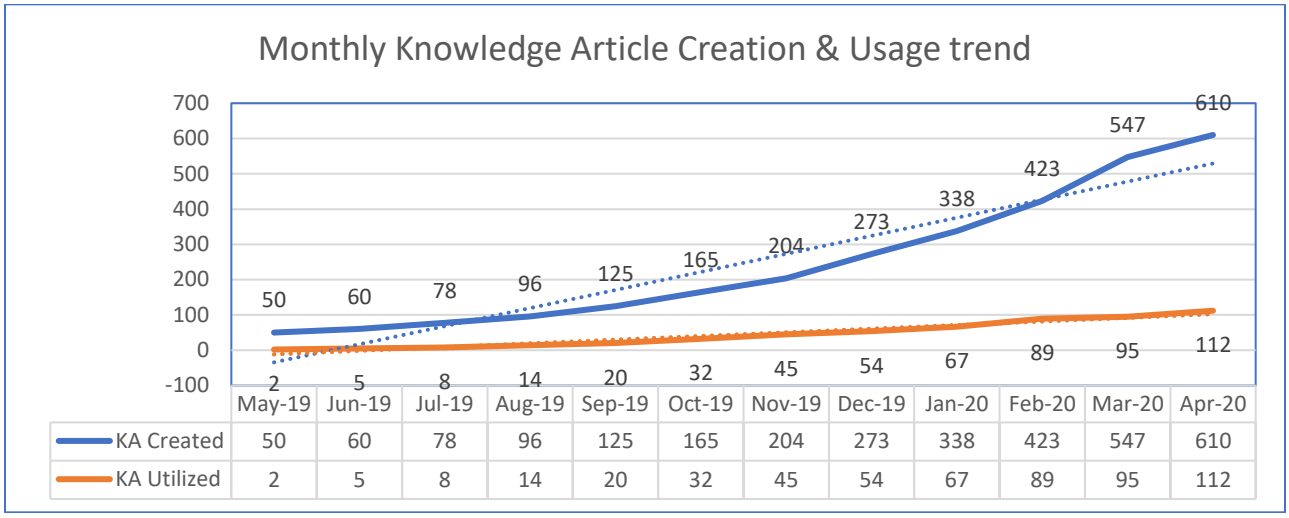


The below table-8 and graph-8 gives an overall monthly Knowledge articles created, and knowledge article utilized by the support team. The articles created and utilized percentage is in increasing trend as part of KM implementation.

Table -8: Monthly Knowledge Article Creation & Usage trend

Month	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	Grand Total
KA Created	50	60	78	96	125	165	204	273	338	423	547	610	2969
KA Utilized	2	5	8	14	20	32	45	54	67	89	95	112	543

Graph-8: Monthly Knowledge Article Creation & Usage trend

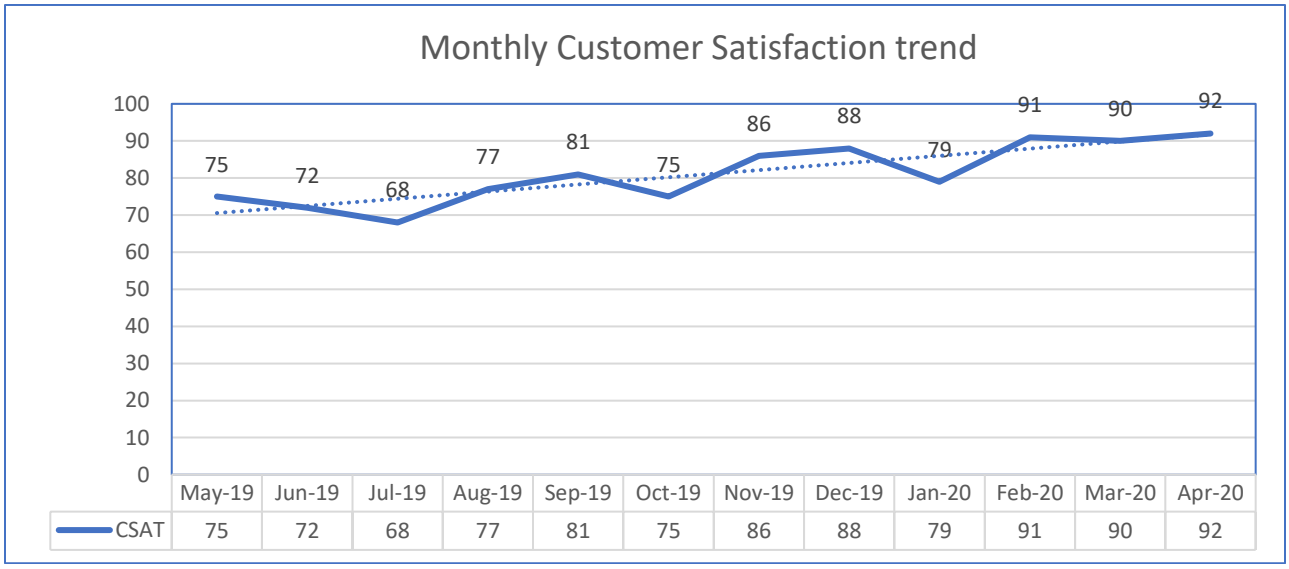


The below table-9 and graph-9 gives an overall monthly customer satisfaction trend for an year. The customer satisfaction level is increasing on month on month basis.

Table -9: Monthly Customer Satisfaction trend

Month	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	Grand Total
CSAT	75	72	68	77	81	75	86	88	79	91	90	92	974

Graph-9: Monthly Customer Satisfaction trend

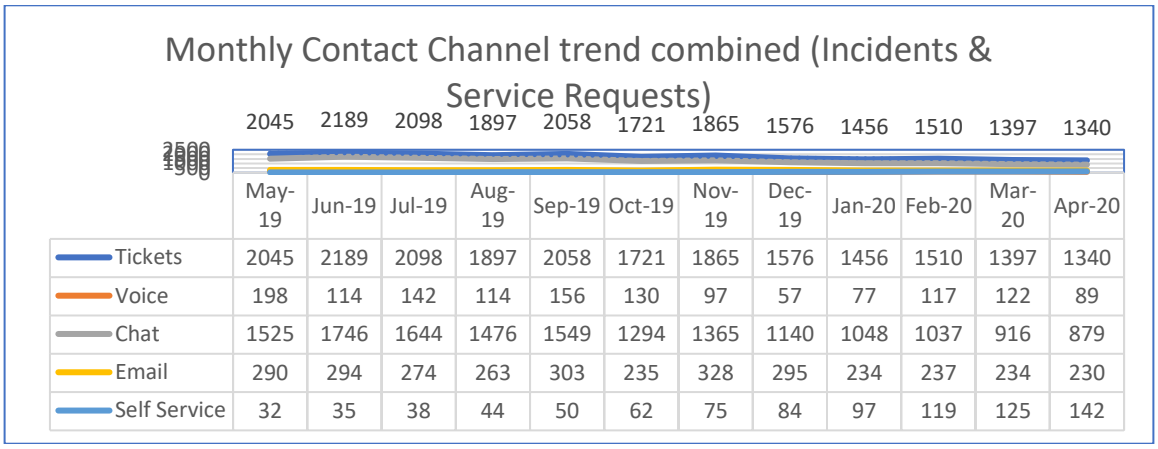


The below table-10 and graph-10 gives an overall monthly customer contact channel ticket trend for Incidents and Service requests serviced by the organization. The volume contribution for Voice is 7%, Chat is 74%, Email is 15% and Self Service is 4%.

Table -10: Monthly Contact Channel trend combined (Incidents & Service Requests)

Month	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	Grand Total
Tickets	2045	2189	2098	1897	2058	1721	1865	1576	1456	1510	1397	1340	21152
Voice	198	114	142	114	156	130	97	57	77	117	122	89	1413
Chat	1525	1746	1644	1476	1549	1294	1365	1140	1048	1037	916	879	15619
Email	290	294	274	263	303	235	328	295	234	237	234	230	3217
Self Service	32	35	38	44	50	62	75	84	97	119	125	142	903

Graph-10: Monthly Contact Channel trend combined (Incidents & Service Requests)

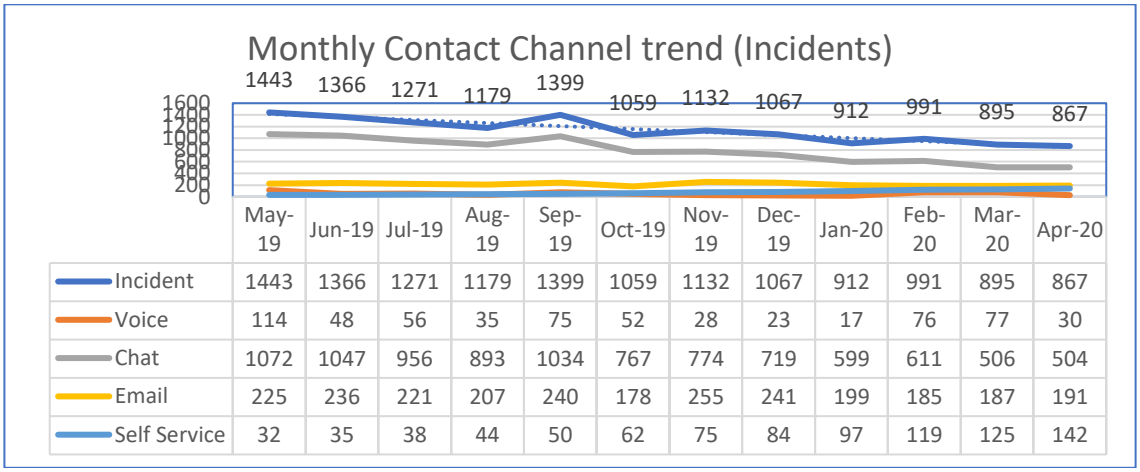


The below table-11 and graph-11 gives an overall monthly customer contact channel ticket trend for Incidents serviced by the organization. The volume contribution for Voice is 4.5%, Chat is 70%, Email is 19% and Self Service is 6.5%.

Table -11: Monthly Contact Channel trend (Incidents)

Month	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	Grand Total
Incident	1443	1366	1271	1179	1399	1059	1132	1067	912	991	895	867	13581
Voice	114	48	56	35	75	52	28	23	17	76	77	30	631
Chat	1072	1047	956	893	1034	767	774	719	599	611	506	504	9482
Email	225	236	221	207	240	178	255	241	199	185	187	191	2565
Self Service	32	35	38	44	50	62	75	84	97	119	125	142	903

Graph-11: Monthly Contact Channel trend (Incidents)

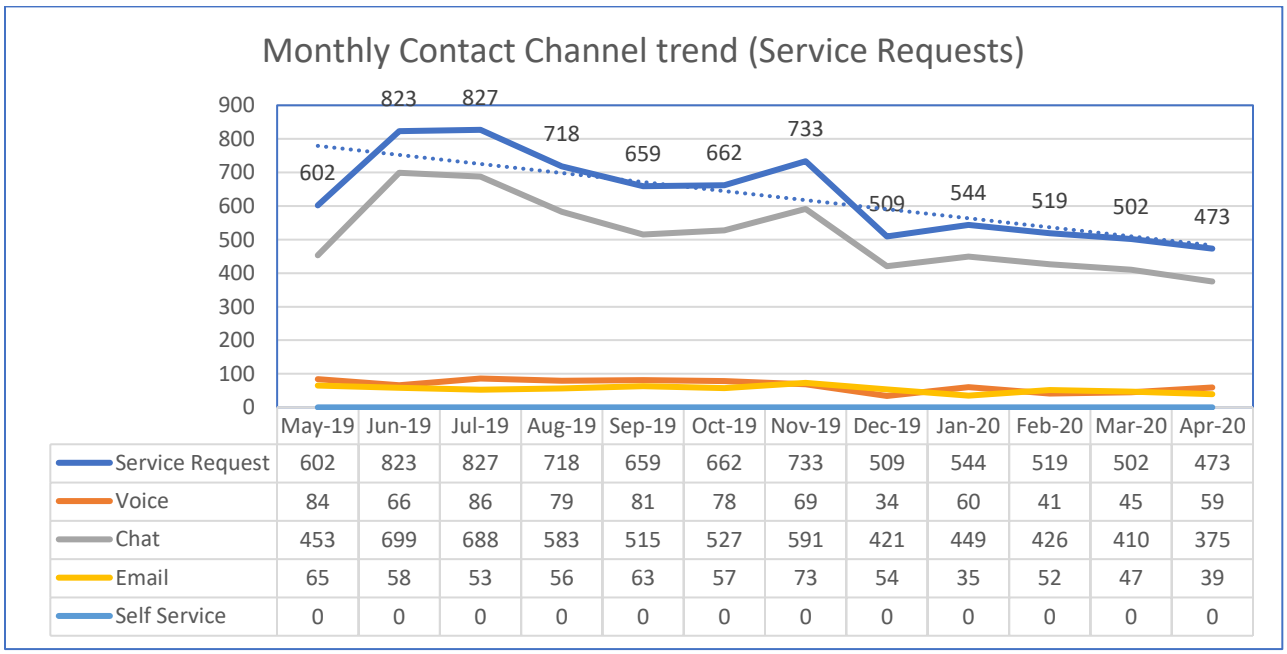


The below table-12 and graph-12 gives an overall monthly customer contact channel ticket trend for Service request serviced by the organization. The volume contribution for Voice is 10%, Chat is 81% and Email is 9%.

Table-12: Monthly Contact Channel trend (Service Requests)

Month	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	Grand Total
Service Request	602	823	827	718	659	662	733	509	544	519	502	473	7571
Voice	84	66	86	79	81	78	69	34	60	41	45	59	782
Chat	453	699	688	583	515	527	591	421	449	426	410	375	6137
Email	65	58	53	56	63	57	73	54	35	52	47	39	652
Self Service	0	0	0	0	0	0	0	0	0	0	0	0	0

Graph-12: Monthly Contact Channel trend (Service Requests)



5. FINDINGS AND RECOMMENDATIONS

Systematic Knowledge Management implementation in the IT Service Delivery organization helps to better track the tickets raised by the customers, provides self-service opportunities for the customers and improves the support response and resolution time. Continuous Service improvement activities helps to accelerate service management and Knowledgement Management activities. The analyses reveals the ticket volume trend is getting reduced over the period of time and overall Customer satisfaction is improving month on month basis. The adoption of KM shows improvement as both Knowledge article creation and usage by the support team is evident. Self service channel is utilized for incident tickets, but the same could be leveraged for service request tickets to improve the support cycle time and further customer satisfaction.

6. CONCLUSIONS

The study shows Knowledge Management (KM) practice implementation and usage in IT Service Delivery Industry in India is having positive impact. Considering time, cost and effort, one of the large IT organization with 50,000 employees and having offices in multiple locations providing 10+ years of service in India was chosen for conducting the study. This study used one year primary and secondary data consisting of incidents and requests registered by the customers. The knowledge article creation and usage trend shows consistent improvement month on month basis, which is an indication of the benefits seen by the stakeholders. The customer satisfaction is consistently on the positive trend and self-service channel usage for incident reporting and resolution is encouraging. The Self-service channel could be leveraged for Service Requests as well. Overall Knowledge management contributes to the betterment of the service levels and improves the customer satisfaction. Knowledge Management creates a positive environment by having all the implicit and explicit knowledge documented, utilized, reviewed and improved as part of continuous improvement cycle.

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