Implementation & Analysis of Knowledege Center in Babcock Borsig Softech (P) Limited, Chennai

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ABSTRACT

Knowledge Center is a knowledge integration system and corroboration engine designed to facilitate an evolving multi-disciplinary dialog leading to new insights and discoveries and to bring the benefits of collective wisdom to the organisation's decisions.

Babcock Borsig Softech (P) Ltd., Chennai is a complete engineering design solution provider with a strong pedigree of working with global clients, offering end-to-end engineering solutions. It is a 100% EOU registered with STPI. The study was done in Civil & Structural department of BBSPL, which provides all essential tools for an error-free logging, management and distribution of the data required for the projects in the departments/organization.

The documents maintained by C&S department staff were not shared by others and both soft and hard copies were not in order. These problems resulted in low productivity, more time consumption, duplication, wrong referencing, more storage space, poor presentation and poor updation.

Hence a knowledge center had been proposed to overcome the above problems with greater availability and sharing in less time. This study had been done to identify and apply a suitable methodology for assessing the knowledge processing environment of the company and to analyse the performance of the knowledge centre, which provides the organization, a sound baseline from where knowledge-based interventions can be launched.

The required data like policies and programmes that impact the knowledge processing practices and behavior of the members were collected through duel moderator focus groups, personal interviews and

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questionnaires. The minutes of the meeting of the focus group were recorded. The meetings were arranged twice to frame the system and review the same. On the basis of the investigation, a generic folder structure was created. As the project changes over time and the knowledge increases the structure can be updated.

The questionnaires were answered by the C&S department staff to elicit information about the working method and the time spent before and after implementing KC. SPSS has been used to evaluate the effectiveness of implementation of the KC through percentage analysis and Paired T test.

The analyses found improved knowledge sharing culture, reduced searching and checking time, improved indexing and updation, reduced development cycle time, improved data utilization & management, reduced rework, reduced paper work and increased availability of documents.

The study recommends the C&S department to decide upon the knowledge processing practices which would be valuable to the organization, including financial assistance for formal training and to decide and formulate the desired policies and programmes to render impetus to those practices that are considered to be of value. This research explored how organizations go about producing and integrating knowledge.

TAKING INDIAN BUSINESS AHEAD

Professor Vijay Govindarajan, International Business, Amos Tuck School of Business Administration, Dartmouth College, US says organisations that operate within a short time frame base their actions on the assumption that their industry is stable and static. But it takes years for large organisations to change directions. Distinct industries like entertainment, telephony and computing are converging. Rapidly escalating concerns about security and the environment are creating unforeseen markets. And subtle changes are important towards more empowered customers, the aging population in the developed world, and the rising middle class in the developing world. So, companies find their strategies need constant reinvention because the old assumptions are no longer valid. The only way to stay ahead is to innovate.

He also says, 'for India to grow aggressively in the next 25 years, we must innovate; and not just focusing only on operational excellence in current businesses. Since innovation is the key to India's supremacy, the corporate sector should strategise for innovation. Companies manage the present, to improve current businesses; selectively abandon

the past and create the future for breakout performance and growth. Many organisations restrict strategic thinking. This has been particularly acute among Indian companies as most leaders have emphasised on reducing costs and improving margins in current businesses'.

Influence of IT causes a total change in Indian business environment. With more competitive climate, the responsibilities placed on industry and its managers have become much greater. There are challenges to managers with hope for more initiative and creativity, leading to success for the industry and the whole nation. The world countries are reorienting their IT infrastructure, gearing up to a world that is going to be much more integrated. Globalisation is opening doors to leverage IT.

Babcock Borsig Softech (P) Limited

BBSPL is a multi-disciplinary design and detailed engineering Consultancy Company based at Chennai. The Company was originally a 100% subsidiary of IDEA and has reputed customers in India and abroad. BBSPL is also a 100% EOU and is registered with the STPI. BBSPL has subsidiaries and affiliates in US and Germany.

BBSPL handles projects in Process, Power and Manufacturing Sectors. In the manufacturing sector, BBSPL has exclusive focus in CAD / CAM based engineering and design using high end software like XSTEEL, CATIA, Solid Edge, COSMOS, hypermesh etc. The Company is ISO 9001:2000 certified by TUV and has competent technical personnel with international design and engineering exposure. BBSPL is enlisted with leading Commerce Chambers and is a prestigious member of CII, IACC and IGCC.

The study was done in Civil & Structural (C&S) department of BBSPL, which manages and distributes data required for the projects. The department is also responsible for RCC & structural design and details. The department comprises of a project manager, team leaders, checker and detailers.

Problems in C & S Department

C&S department maintains client documents, codes, standards, references & samples, ISO documents, quality manuals, guidelines, procedures, project approval documents and drawings & reports. But they were kept by individuals for their own use; i.e. the documents are not shared by everyone with in the department/company. And document copies (both soft and hard) were not in order. There is no knowledge sharing culture. This caused difference in presentation of documents, high search time to find a file, wrong references, duplication, more storage spaces, improper updations and less productivity and efficiency.

Objective of the study

This research is an attempt to give an account of knowledge-based practices within the organisation. The study examines the practices and behaviours for knowledge production and knowledge integration. The objectives are:

- to reduce the non-productive time of the project by implementing a knowledge center.
- to reduce the time required to search, create or modify the documents.
- to make standards, references and specifications available across the organization.
- to share the knowledge available amongst each individual.

Knowledge Centre

Implementing Knowledge Centre (KC) is an innovative strategy for an organisation. Knowledge available should be shared amongst each individual. The classified knowledge of an organization put into practice with some thought generates more information and more knowledge. It is a continuous cycle. Otherwise the knowledge becomes either obsolete or remains is not relevant/ useful.

KC is a knowledge integration system and corroboration engine designed to facilitate an evolving multi-disciplinary dialog leading to new insights & discoveries and to bring the benefit of collective wisdom for decisions making. KC uses an open source submission, annotation and filtering process to gather and compile the collective knowledge and experience of individuals and organizations across the boundaries.

The system facilitates personal access to relevant ideas, while allowing individuals to contribute their unique pieces to the emerging picture. This self-organizing/building system uses our input, comments and feedback to create a centrally evolving body of knowledge that can be accessed. KC is designed to facilitate collective brainstorming, productive dialog leading to new insights, inter-disciplinary cross-validation & testing of ideas and access to multiple perspectives.

Knowledge Center (KC) is the conversion and representation of knowledge available with each individual in a tangible format. Knowledge is created and available with human beings. The major challenge in KC is to collate this knowledge and make it available across the organization.

This study had been done to identify and apply a suitable methodology for assessing the knowledge processing environment of the company and to analyse the performance of the knowledge centre, which provides the organization, a sound baseline from where knowledge-based interventions can be launched.

Research Design

- Primary Data:
  Minutes of the Meetings of Focus Group
  Personal Interviews
  Performance of the Knowledge Centre
- Population:
  C & S Dept. Staff
- Sampling :
  Population Sampling
- Analysis Techniques :
  Percentage Analysis, Paired T Test
- Analysis Tools :
  SPSS

DATA COLLECTION

The primary data were collected by 1. Focus Group and 2. Questionnaire

Focus group

Dual Moderator Focus Group discussion was suggested for developing a KC. In Dual Moderator focus group, one moderator ensures the session progresses smoothly, while another ensures that all the topics are covered. Focus group was formed by selecting the experienced people from each designation in C&S Department.

The meetings were arranged twice to frame the system and review the same. In the first meeting, unstructured discussion happened in the group with regard to the problems faced in project handling, ideas, attitude & feeling for implementing KC, experience in the concerned issues, current document format, work flow practices and procedures and problems faced in revision handling. The minutes of the meeting of the focus group were recorded. Ideas from the discussion were used to create the Knowledge Center.

Points Discussed

- Importance of managing and controlling the data
- Requirements of documents and references
- Creation of common pool to collect the documents and references
- Collection and segregation of data
- Basic folder frame work. & assigning folder permissions and responsibilities
- Numbering the standard files, references, standard drawings.
- Problems faced in handling revision projects

After the first meeting, the knowledge needs, knowledge resources and knowledge flows had been identified and processes critical to success were determined for the KC. Related strategic and

knowledge domains were identified. To store data in a structured way is a core function in a KM System. On the basis of the investigation a generic folder structure was created (Appendix-1). To manage different versions is another key function. As the project changes over time and the knowledge increases the structure can be updated.

The common pool was created by one staff data collection and storage was done by other staff. In the common pool, separate folder was created for individuals to avoid the over writing. Folder creation in system for maintaining the documents was formed. Document analysis and segregation process was made.

KC Administrator has all the rights to add / remove material in the KC. Project Manager, Sr. Project Engineers and HoDs have access to all the folders and selective rights to the Administrator folder. Detailers have read only access and they do not have add / modify rights.

Once the system is framed, the second meeting was arranged to discuss regarding the KC framework and implementation.

Points Discussed

- Structure of KC – changes, finalisation.
- Files to be maintained in the folders.
- Index for structural components has created
- Implementation
- Questionnaire for performance measurement

Questionnaires

In order to gain an understanding of the status of the knowledge processing environment, it was initially decided to administer a survey questionnaire to elicit information about the working method and the time spent before implementing KC and after implementing KC. Questionnaires were designed and distributed to C&S department staff for analyzing the following (Appendix-2).

- Time required to search a document before implementing KC & after implementing KC
- Time required to create/modify a component before implementing KC & after implementing KC
- Availability of components before implementing KC & after implementing KC

ANALYZING THE EFFECTIVENESS OF IMPLEMENTATION OF THE KC

The questionnaires were answered by the C&S department staff to elicit information about the

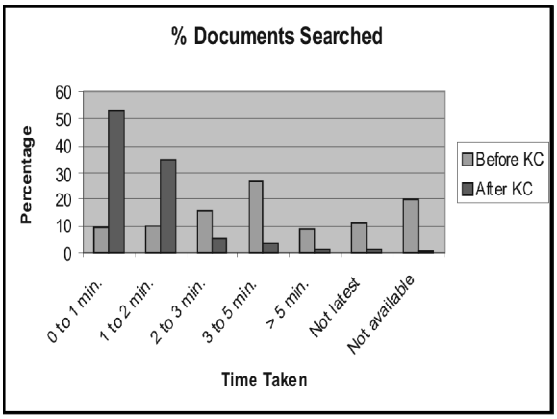
working method and the time spent before and after implementing KC. SPSS has been used to evaluate the effectiveness of implementation of the KC through percentage analysis and Paired T test.

Documents searched before & after implementing KC

Table1: Percentage of Documents Searched Before & After Implementing KC

Time Limit	% Documents Searched	
	Before KC	After KC
0 to 1 min.	08.89	53.33
1 to 2 min.	10.00	35.00
2 to 3 min.	15.56	05.56
3 to 5 min.	26.67	03.33
> 5 min.	08.33	01.11
Not latest	11.11	01.11
Not available	19.44	00.56
Total	**100.00**	**100.00**

Figure 1: Percentage of Documents Searched Before & After Implementing KC



Time difference :

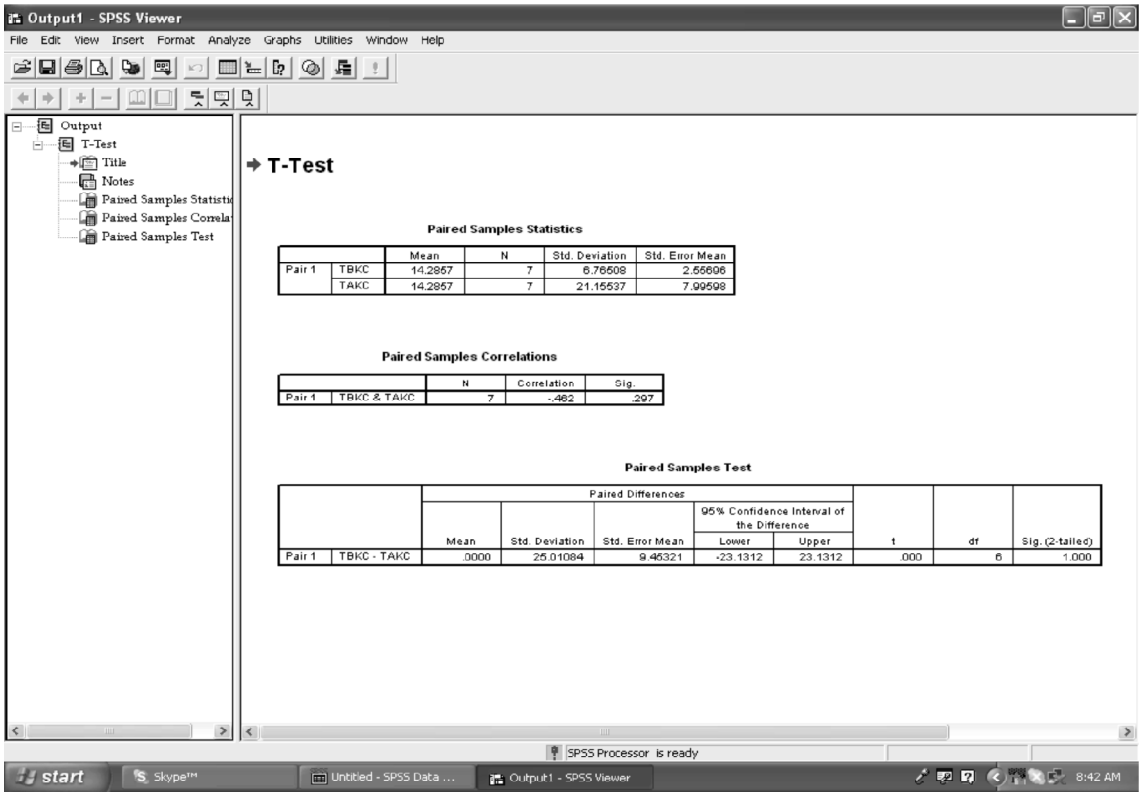
Average time required to search a document before implementing KC = 372 min.

Average time required to search a document after implementing KC = 201 min.

Average time saved in searching a document after implementing KC = 171 min.

Percentage of time saved in searching a document (171/372 *100) = 46%

Table 2: Paired T Test



Availability of components before & after implementing KC

Table 3 : Percentage of Availability of Components Before & After Implementing KC

Status	% of Availability of Components	
	Before KC	After KC
Available	05.00	84.44
Available but need modification	17.78	13.33
Not available	77.22	02.22
Total	**100.00**	**100.00**

Figure 2 : Percentage of Availability of Components Before & After Implementing KC

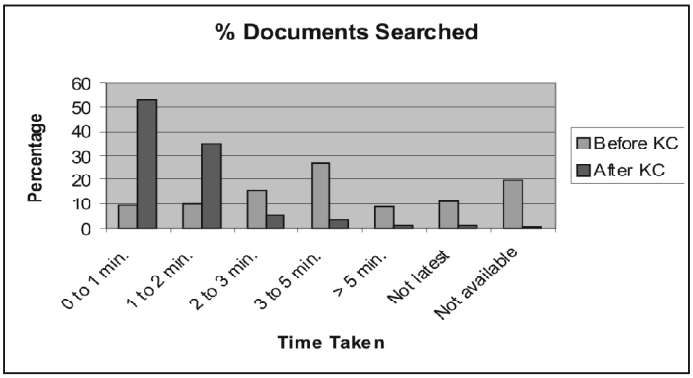


Table 4 : Paired T Test

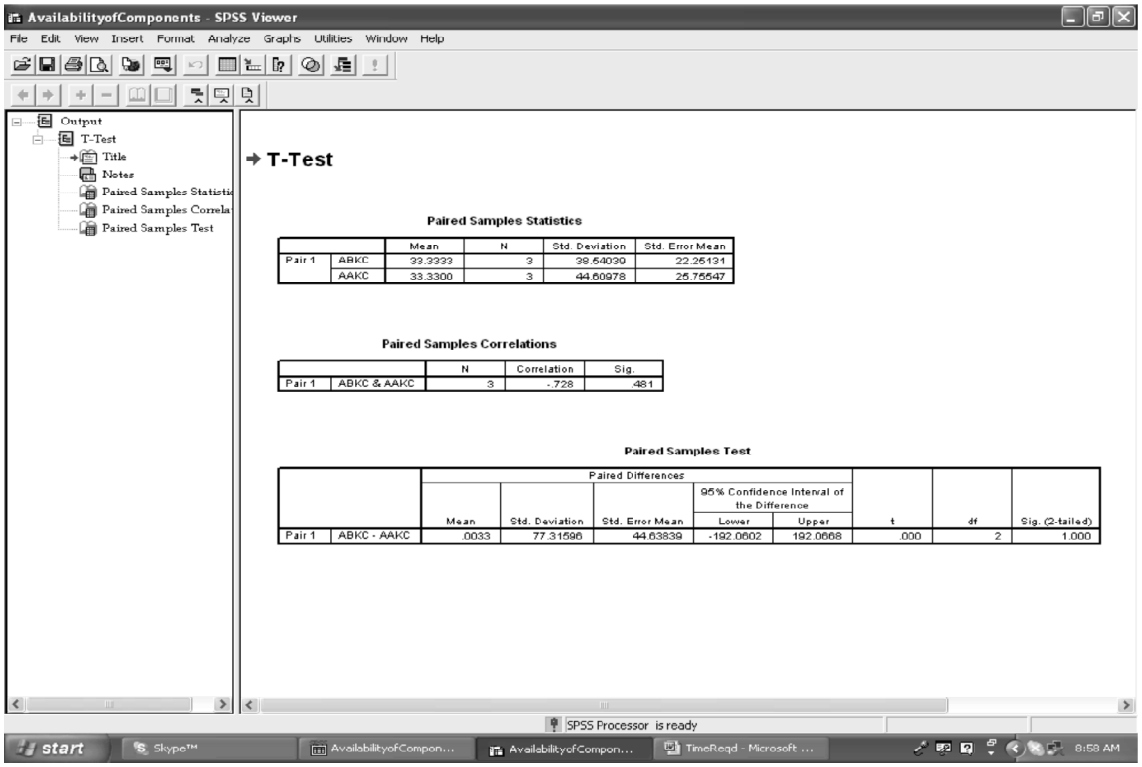
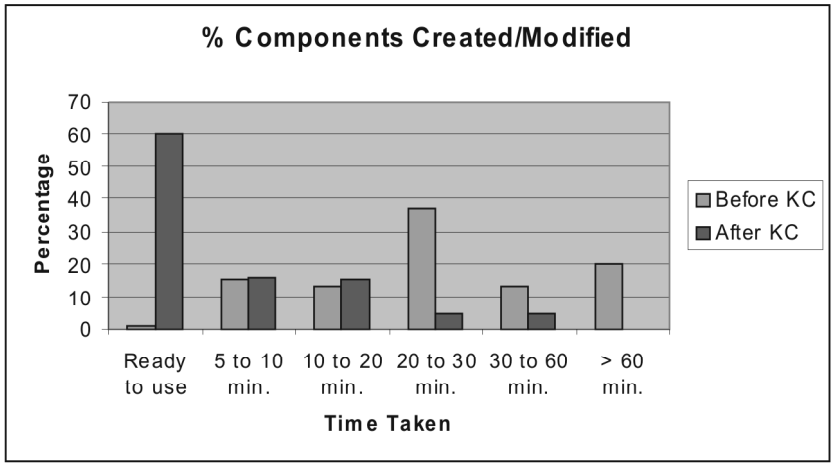


Table 5: Percentage of Components Created/Modified Before & After Implementing KC

Time Limit	% Components Created/Modified	
	Before KC	After KC
Ready to use	01.11	60.00
5 to 10 min.	15.00	15.56
10 to 20 min.	13.33	15.00
20 to 30 min.	37.22	05.00
30 to 60 min.	13.33	04.44
> 60 min.	20.00	00.00
Total	100.00	100.00

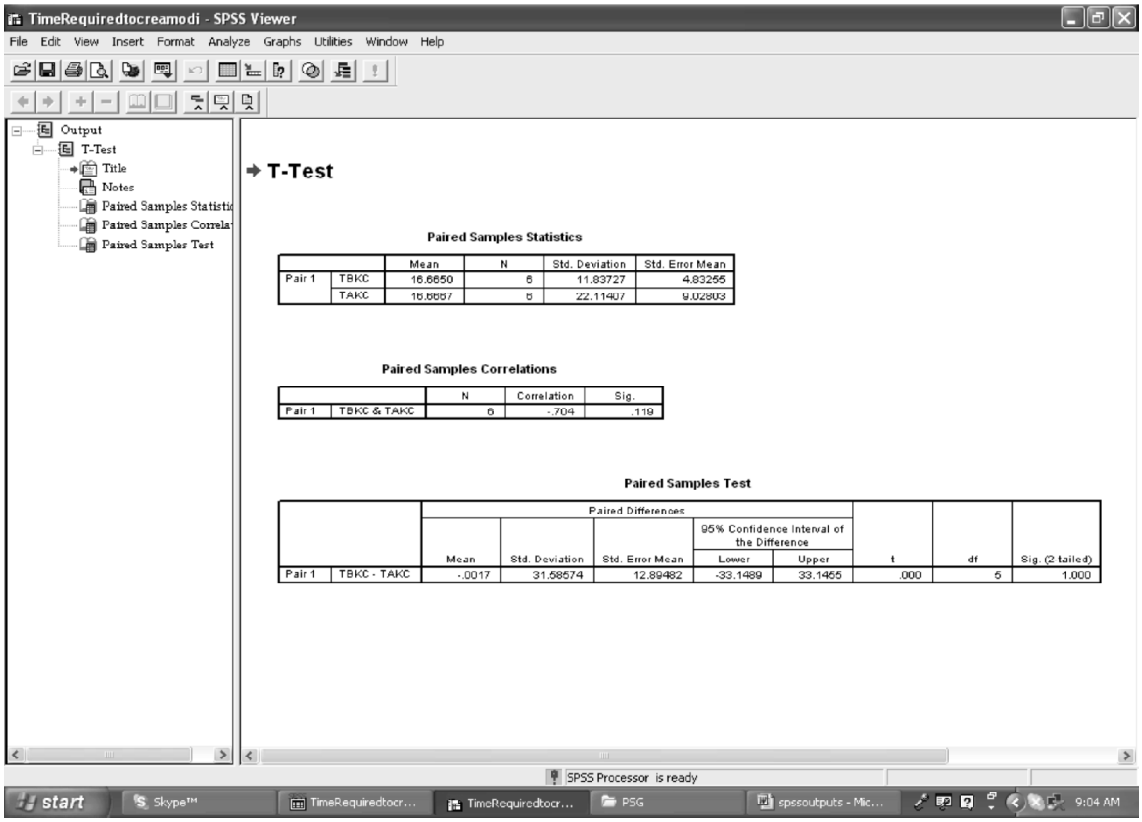
Figure3 : Percentage of Components Created/Modified Before & After Implementing KC



Time difference :

Average time required to create/modify components before implementing KC	= 455 min.
Average time required to create/modify components after implementing KC	= 121 min.
Average time saved in creating/modifying a component	= 334 min.
Percentage of time saved in creating/modifying a component (334/455 *100)	= 73%

Table 6: Paired T Test



SUMMARY OF FINDINGS & RECOMMENDATIONS

- Reduced searching time by 46% (90% of the documents were found in 2 minutes).
- Improved data utilization and management.(85% of the components were found available).
- Reduced components creation/modification time by 73% (90% of the components were created/modified in 20 minutes).

Recommendations to the civil & structural department

1. to decide what knowledge processing practices would be valuable to the organization.
2. to decide and formulate the desired policies and programmes to render impetus to those practices.
3. to emphasize that programmes and policies need to be aligned.
4. to engage themselves in limited self-directed learning with the support of management.
5. to provide financial assistance for formal training & conferences and individual & group learning sessions.

CONCLUSION

Views of many people were that the KC implemented is very effective and efficient. Since standards have been framed to manage the data, it has become very easy for the people to handle it. They are able to provide effective output without errors and efficiency also improved due to time saving. KC helps in creating a process for managing and controlling the data in the C&S department. Knowledge sharing culture has been initiated in C&S department.

The saved time is used for other productive works. The information is reused. The Revisions and updations are being managed suitably. Project development cycle time has come down. The staff are able to support the business strategy by getting more projects

This research explored how organizations go about producing and integrating knowledge. Practices and behaviours endemic to the knowledge processing environment were assessed, including the policies and programmes that influence such behaviours. In future, we can implement KC to the other departments like process, instrumentation, piping & pipelines, electrical, mechanical, procurement, inspection and automotive in BBSPL. Also we can deeply analyze to understand the drawbacks of each system and can suggest for improvements in the feature of the KC in BBSPL.

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Websites:

- www.knowledgecentre.com
- www.macroinnovation.com

Abbreviations:

- IDEA - International Development & Engineering Associates Ltd.
- KC - Knowledge Centre
- KM - Knowledge Management

4. BBSPSL - Babcock Borsig Softech (P) Limited
5. IACC - Indo-American Chamber of Commerce
6. IGCC - Indo-German Chamber of Commerce
7. C&S - Civil & Structural

APPENDIX

Descriptive Folder View

QUESTIONNAIRES

QUESTIONNAIRE 1 : Time Required to search a Document

Name :		Emp. No. :						
Sl. No.	Name of the Document	Time required to search the Document						
		0 to 1 min.	1 to 2 min.	2 to 3 min.	3 to 5 min.	> 5 min.	Not latest	Not available
1	OSHA-VOSH Steel ErectionStandardsRev2005							
2	DIN Steel Properties							
3	Design Of Bolts							
4	Angle Base Plate detail for Indian sections							
5	Splice Plate detail for Indian sections							
6	Fabenco Safety Gates							
7	Standard Welding Symbols							
8	Structural Bracing Calculation							
9	Europe Standard Dwgs-002							
10	REP Standard For Platforms							
11	PIP Standard For Ladder							
12	AQCS - 3939-9-6506 rev-3							
13	WAPC - 3939-9-2869 rev-1							
14	AISC Load and resistance factor design specification for structural steel buildings							
15	AISC-Manual For Steel Construction							
	Total							

QUESTIONNAIRE - 2 : Component Attribute/Calculation Availability

Name :		**Emp. No. :**		
Sl. No.	**Name of Attribute**	**Component Attribute / Calculation Availability**		
		Available	**Available but need modification**	**Not available**
1	W14X68_W14X43_BB_DSCA			
2	W24X76_W24X76_BB_DSCA			
3	W12X65_W18X35_CB_SP			
4	W12X65_W8X10_CB_SP			
5	W12X14_W12X14_BB			
6	W30X90_W30X90_BB			
7	W12X65_BASE PLATE			
8	Design calculation for Anchor bolt			
9	Design calculation for Lifting Lug			
10	Design calculation for Moment Connection			
11	Stair Stringer with 1" grating			
12	HEA240_HEA200_CB_SP			
13	HEA300_HEA280_BB_DSCA			
14	MB300_MB250_CB_SP			
15	MB300_MB300_CC_SPLICE CONNECTION			
	Total			

QUESTIONNAIRE – 3 : Time Required to Create / Modify a Component

Name :		**Emp. No. :**					
Sl. No.	**Name of Attribute**	**Time required to create/modify Component**					
		Ready to use	**5 to 10 min.**	**10 to 20 min.**	**20 to 30 min.**	**30 to 60 min.**	**> 60 min.**
1	W14X68_W14X43_BB_DSCA						
2	W24X76_W24X76_BB_DSCA						
3	W12X65_W18X35_CB_SP						
4	W12X65_W8X10_CB_SP						
5	W12X14_W12X14_BB						
6	W30X90_W30X90_BB						
7	W12X65_BASE PLATE						
8	Design calculation for Anchor bolt						
9	Design calculation for Lifting Lug						
10	Design calculation for Moment Connection						
11	Stair Stringer with 1" grating						
12	HEA240_HEA200_CB_SP						
13	HEA300_HEA280_BB_DSCA						
14	MB300_MB250_CB_SP						
15	MB300_MB300_CC_SPLICE CONNECTION						
	Total						