Online Collaboration and Project Management Technologies Exposed:
"Harvard Design School Study on the Value of OCPM Software and Services"

March 8-9, 2006 Cambridge l MA

Burçin BECERIK

Research Findings

Value Assessment

Suitability & Industry Practices

Team Communication and Document Management

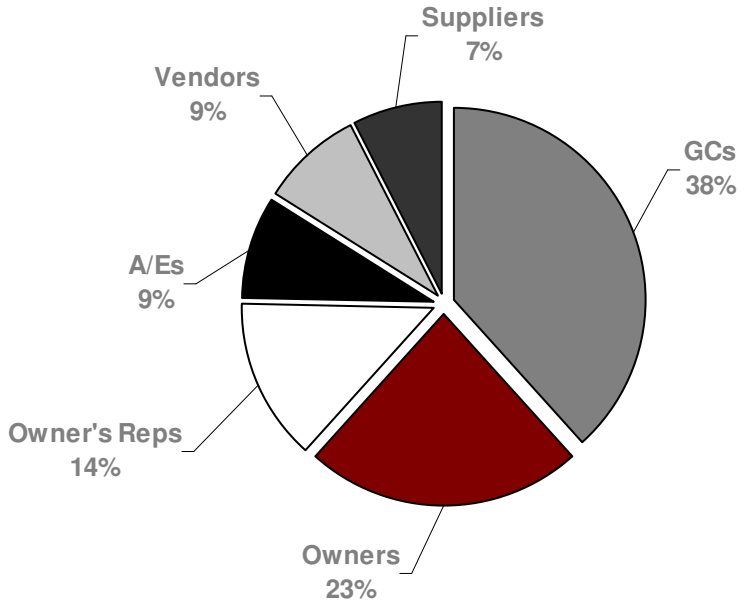
support various modes of communication, act as a repository of various documents, allow storage , sharing and timely exchange of information and project documents

Work Flow and Process Automation

support various business models by managing the flow of information, monitoring and recording the progress of tasks as a result reduces cycle time, automate workflow

Process and Project Management

support process and project monitoring and management, provides better management of the resources



1. Interviews

December '04 – July '05

102 interviews with 81 industry stakeholders

2. Case studies

Business Collaborator – UK

Nationwide Building Society, Royal Bank of Scotland (ITG Group)

Constructware – USA

Abbott Laboratories (TRM Healthcare), Indianapolis Public Schools, P.J. Dick Incorporated

eBuild.ca – Canada

Inscape Corporation

Meridian Systems – USA

Kitchell Contractors, Manhattan Contractors

Primavera – USA

LA Unified School Districts

methodology

3. Aggregate data

INTANGIBLE

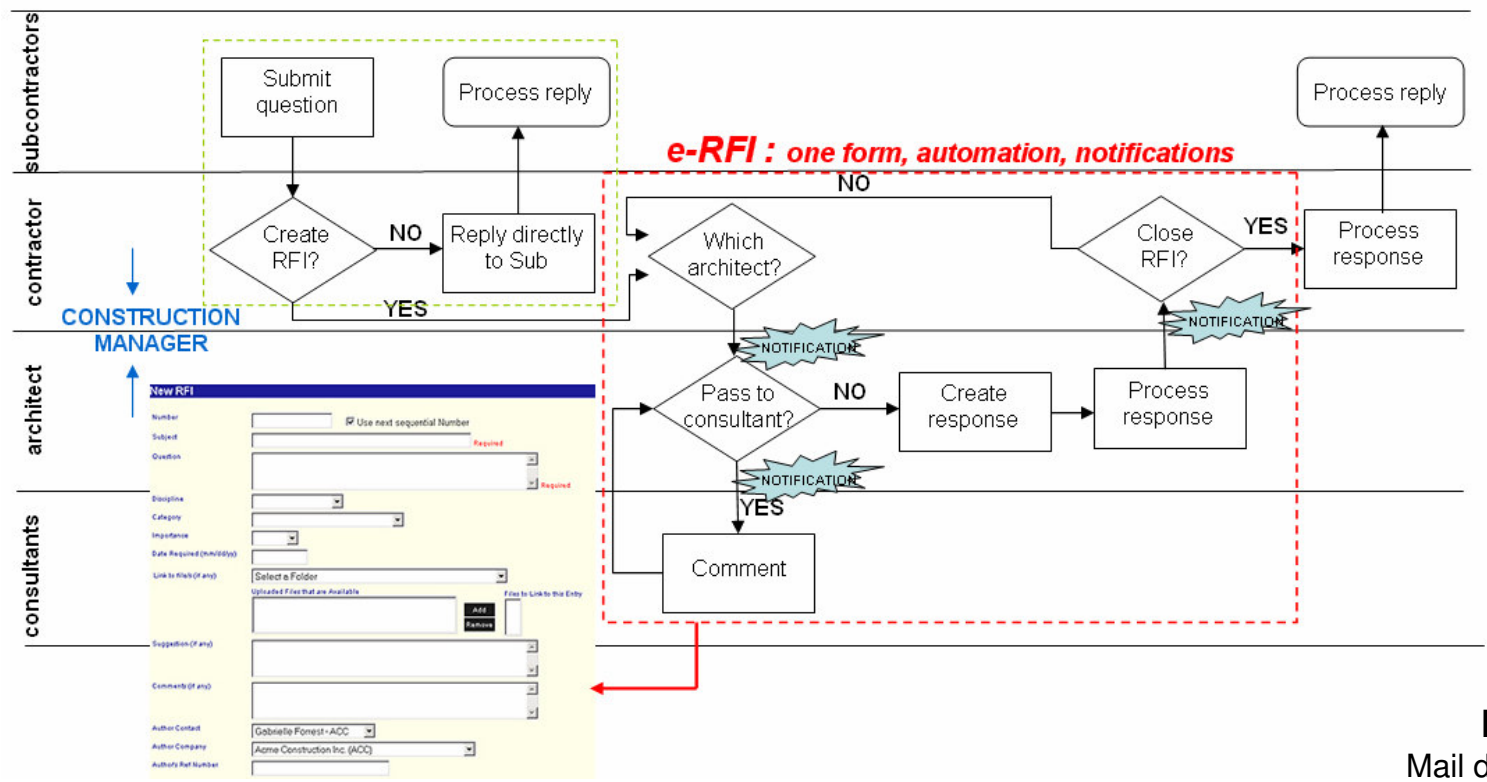
QUASI-TANGIBLE

TANGIBLE

	soft benefits			hard benefits		
	new income/value	**increased income/value**	**avoided costs**	**new income/value**	**increased income/value**	**avoided costs**
project level benefits	ability to refer back to data enables international links better information version control better forecasting and control	decreased work flow turnaround and faster transactions improved quality of the output better communication; fewer information bottlenecks greater integration & process automation improved idea sharing among team members improved capture of design/construction decisions	reduced errors & omissions minimizing project risks advanced purchase of materials	O&M: improved project delivery; early occupancy		reduced/saved staff requirement reduced transaction costs decreased # of RFIs/COs reduced storage requirements reduced litigations and discovery costs
organizational level benefits	Improved company image – RBS Gained Market Access – Inscape Improved Customer Relationships – Inscape Gained Negotiation Power – Inscape Strategic competitive advantage – PJ Dick, Manhattan Claims Mitigation and Management – LAUSD Forecasting – LAUSD Knowledge Management – Nationwide Process reengineering – Nationwide, RBS, LAUSD	Improved data availability 4.35/5 Improved audit trail 4.19/5 Improved information management 4.00/5 Faster reporting and feedback 4.00/5 Accurate/timely information to give valid/accurate decisions 3.97/5 Improved process automation 3.95/5 Improved version control 3.93/5 Better project/program control 3.84/5 Timely capture of decisions 3.63/5 Fewer information bottlenecks 3.57	reduced mistakes better risk management			decreased # of RFIs/COs decreased spending on administration staff & materials reduced communication costs less service workers reduced litigations and discovery costs

Tangibles: *Savings*
example #1: e-RFIs

"The tool is saving time because everything is standardized. Now if I want, I can pull out some reports and understand where we stand."
Brian Killion (Manhattan Construction Company)
Senior Project Manager



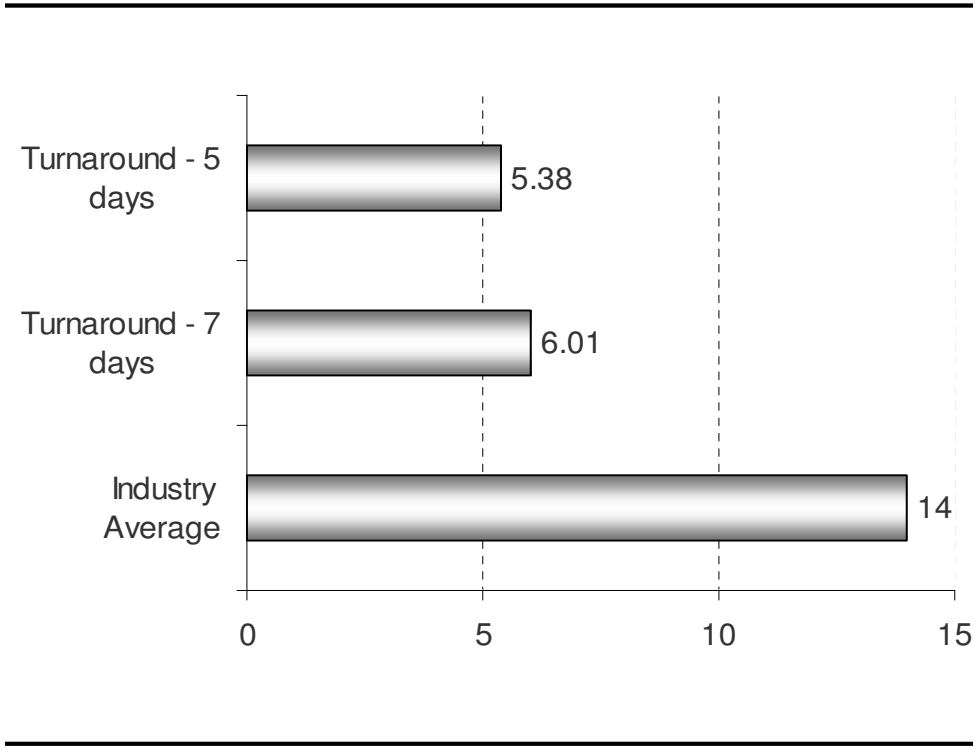
value assessment

NO!
Mail delay
Risk of an RFI not being realized on time or being lost
Faxing
Illegible handwriting
Spreadsheets
Binders

Tangibles: Savings
example #1: e-RFIs

> *"There is no doubt the tool improves the RFI process. We used to have 12 days turnaround time but now it is possible within hours."*
>
> Jack I. Jones, CMU Collaborative Innovation Center
> Superintendent, P.J. Dick, Inc.

e-RFI Turnaround



(based on 7 projects and 5028 e-RFIs)

value assessment

Tangibles: Savings
example #1: e-RFIs

> *"Somewhere along the line, shorter RFI turnaround time should improve the construction schedule and reduce the costs if you are receiving hundreds of RFIs and reducing the turnaround time to 2 days."*
>
> Michael McDonald, Abbott Bioresearch Center

Less time spent on issuing/answering an RFI

5 min vs.45 min

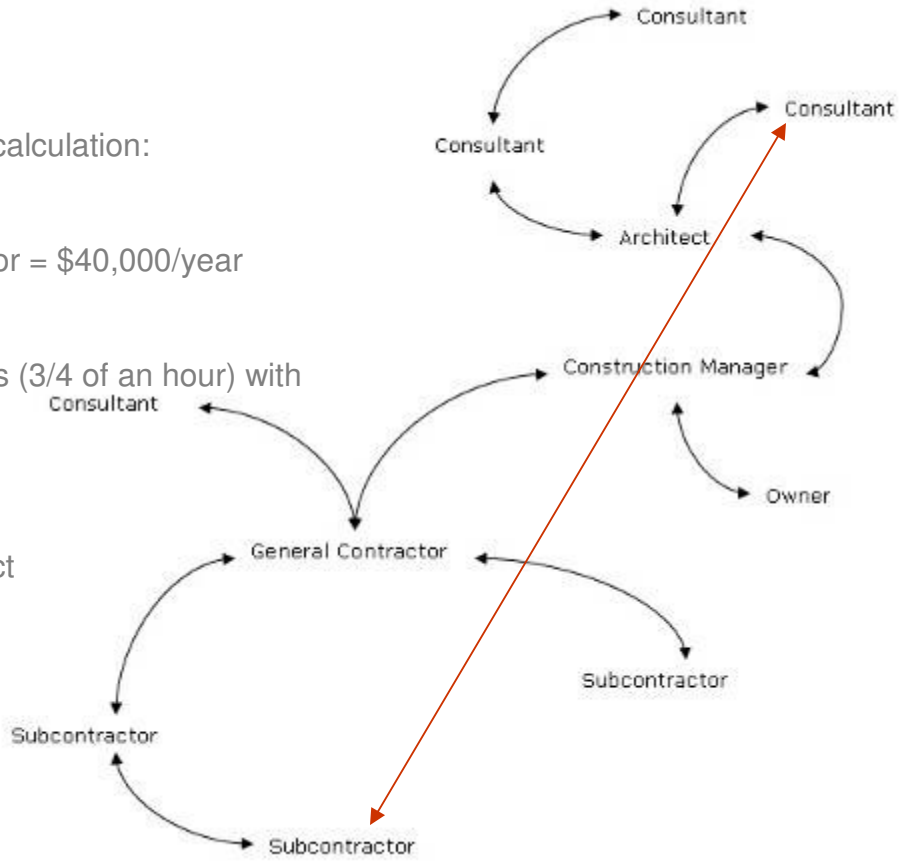
We can estimate the savings with a basic calculation:
Number of RFIs = 130

Average salary of construction administrator = $40,000/year ($25/hour)

Time spent to process an RFI = 45 minutes (3/4 of an hour) with traditional method
¾ X 130 X 25 = $2437

45minutes vs. 5minutes
SAVINGS: [2437/9] X 8 = **$2166** per project

Assume there are 10 projects in the office
2166 X 10 = **$21,660** per year

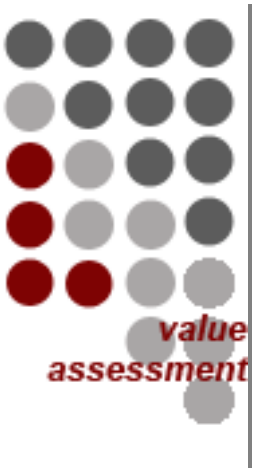


value assessment

Tangibles: Savings
example #1: e-RFIs

Decrease in the number of RFIs

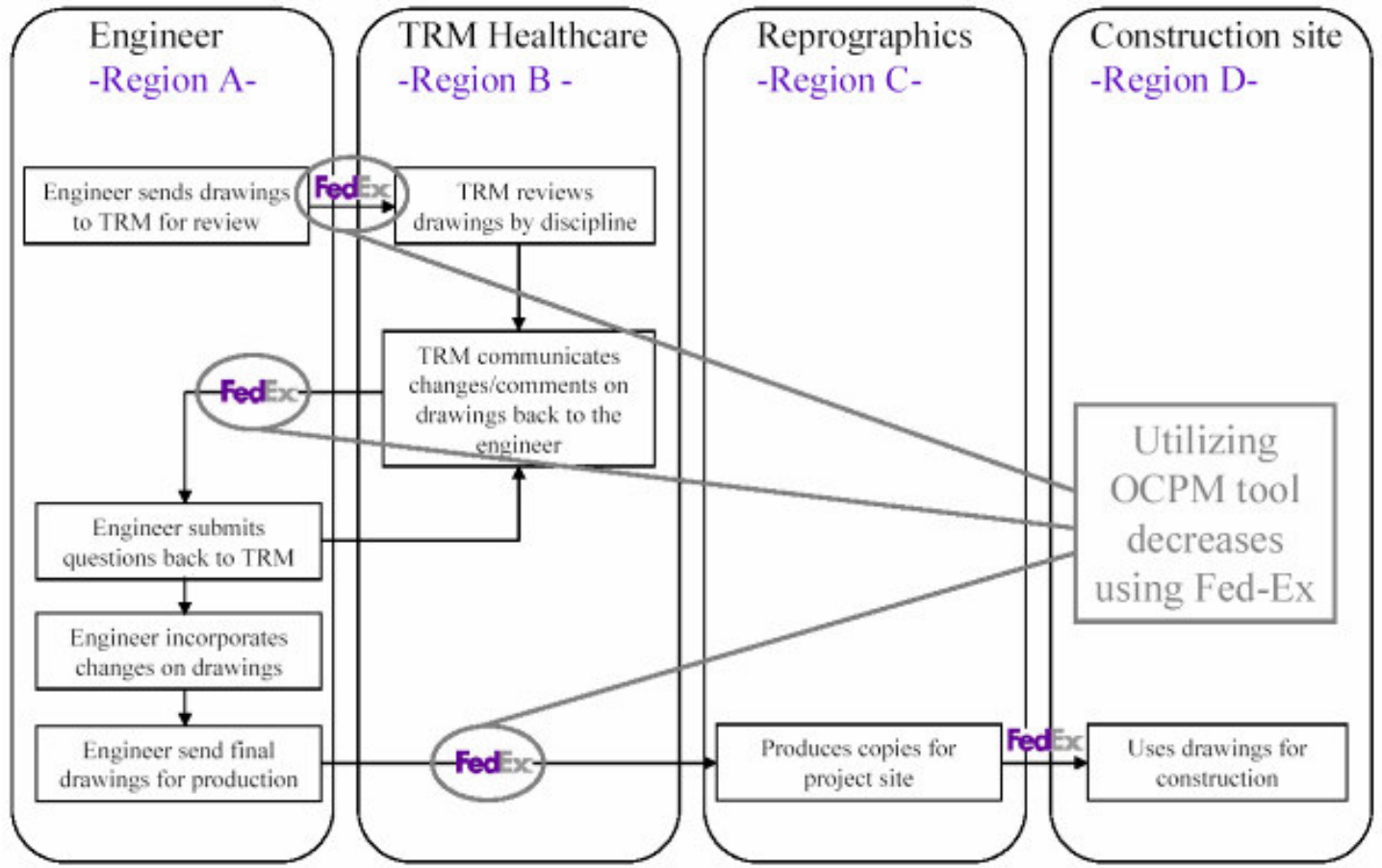
No evidence!



"RFIs are related to the quality of the documents. If someone has a question, he has a question. However, it is easier for the primes to access and review the entire list of questions. In addition, the system clears up the question early in the process in a speedier manner. This avoids mistakes and solves problems early in the process."
Jack Metcalf, Riverside Elementary School Project Manager, Schmidt Associates

Tangibles: Savings

example #2: e-document transfer



value assessment

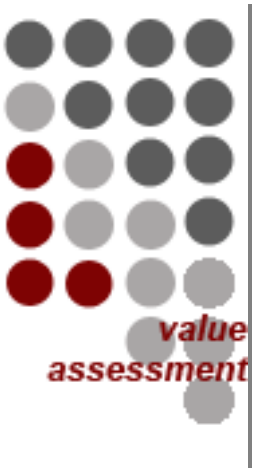
Tangibles: *Savings*

example #2: e-document transfer

FedEx charges for 7 lbs between the destinations:

	Next day	2 day
Region A to B	$ 54.34	$11.55
Region B to A	$ 54.34	$11.55
Region A to C	$70.61	$17.54
Total	$ 179.29	$40.64

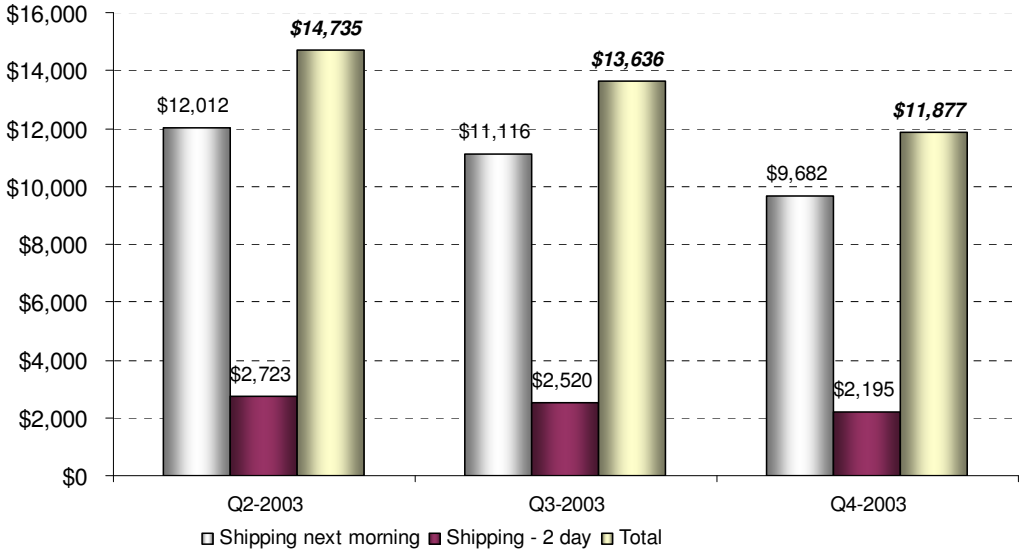
	# of drawings posted	# of packages shipped
2nd Qrt of 2003	6742	134
3rd Qrt of 2003	6271	124
4th Qrt of 2003	5428	108



Assume 50 drawings will weight 7lbs.
Assume half of the packages are sent by 2nd day shipping and the other half is sent by next day shipping.

Tangibles: Savings

example #2: e-document transfer



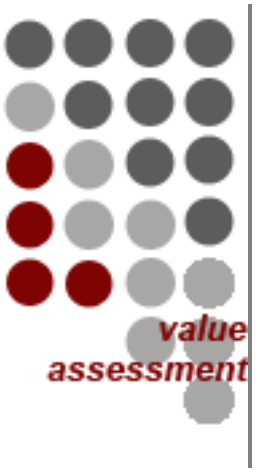
value assessment

Total Savings:	
9 months	$ 40,248
1 year	**$53,664**
3 years	$ 160,992

$53,664 per project; the company has at least 10 similar size/type projects every year!

Tangibles: Savings
example #3: e-bidding

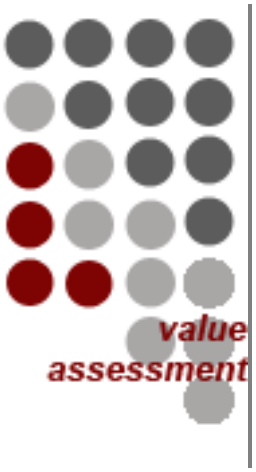
> *Any realized savings for the design review or project administration segments of a construction project only enhance the ROI. I usually quote a low $100,000 in savings that is realized over the annual cost of our site. ($68,000)*
>
> Jay Burris, GSA Project Manager



Variables:
engineer hourly rate: $37.00
administrative staff hourly rate: $18.00
Printing 30 sets of plans (30 full-sheet pages) and specifications (200 pages) = $1000
Overnight shipping of one solicitation package: $15.00

Variables not included in cost estimating:
Normal print request and mailing varied between 30 to 50 packages, sometimes more for larger projects.
Solicitation amendments not included; average of two per solicitation over-nighted ($5) to prospective bidders (50) (estimated $6,000 additional cost)

Tangibles: *Savings*
example #3: e-bidding



Engineer Administration time: $37.00 x 6 hours = $222 x 8 projects = $1,776 x 6 Project Managers
= $10,656 (288 hours)

Contracting Officer Administrative time: $37.00 x 6 hours = $222 x 8 projects = $1,776 x 4 Project Managers
= $7,104 (192 hours)

Administrative Support time: $18.00 x 8 hours = $144 x 20 projects = $2,880 x 6 Project Managers
= $5,760 (320 hours)

Total Associate indirect costs: $10,656 + $7104 + $5,760
= $ 23,520 (800 associate hours expensed)

Printing costs: 30 sets = $ 1,000 x 20 solicitations
= $ 20,000

Mailing costs: 30 sets x $15 (one box and one tube) = $ 450 x 20 solicitations
= $ 9,000

Total direct costs: $ 20, 000 + $ 9,000
= $29,000

Direct and indirect costs associated with solicitations issued during one fiscal year (Oct - Sep)
$ 29,000 (direct) + $ 23,520 (indirect) = **$ 52,520** in realized savings **(for one Service Center)**

They have 6 Service Centers using the same tool in the same Region…

Case Name	**Tangible Benefits** ($)	Quasi-tangible benefits (rating)	Intangible Benefits (identified)	Cost/Program Ratio
Indianapolis Public Schools "Owner"	**$59,000/year** (10 projects)	4/5.00 9 benefits out of 27	Not identified	0.07% (considers 1st program)
Inscape Corporation "Supplier"	*Not considered*	6/5.00 2 benefits out of 27	4 identified: Increased Sales, Better Customer Relation, Negotiation Power.	Pass the cost to the owner
ITG Group "Owner"	*Not considered*	4/5.00 4 benefits out of 27		
Kitchell Contractors "GC/CM"	**$42,000/year** (10 projects)	5/5.00 5 benefits out of 27	Not identified	Pass the cost to the owner
LA Unified School District "Owner"	*Not considered*	4/5.00 9 benefits out of 27	2 identified: Increased Sales, Better Customer Relation.	0.07% (considers 2nd phase expenses (eloc. fees)
Manhattan Construction Company "GC/CM"	**$59,000/year** (18 projects)	4/5.00 3 benefits out of 27	Not identified	0.04% (assumes the firm has at least 4 $100mil. projects every year)
Nationwide Building Society "Owner"	*Not considered*	3/5.00 5 benefits out of 27	Performance Measurement, Focused Learning.	
P.J. Dick Incorporated "GC/CM"	**$47,100/year** (10 projects)	5/5.00 9 benefits out of 27	1 identified: Competitive Advantage	"not released"
TRW Healthcare "Owner"	**$536,500/year** (10 projects)	5/5.00 3 benefits out of 27	Not identified	"not released"

Average savings per project is $149,000

<u>However</u>;
One may argue that this is subjective

<u>Because</u>;
Savings pass from one to another…
It is very difficult to document how much is being printed, mailed, copied between parties…

Although tangible benefits are quantifiable in monetary terms, they are minor (both from investors' and collaborators' point of views) as compared to the rest…

"We focused on organizational-level benefits rather than individual project-level benefits. The reason for this is that business benefits rather than cost savings have always been more important our organization."

Steve Head, Service Support Manager
at Nationwide Building Society

Quasi-tangibles: increased value

Survey Results

answer rate	ranking	effectiveness benefits
37/38	4.35/5	Improved data availability
37/38	4.19/5	Enabled having complete audit trail
37/38	4.00/5	Improved information management
36/38	4.00/5	Enabled faster reporting and feedback
38/38	3.97/5	Provided accurate and timely information to give valid/accurate decisions
38/38	3.95/5	Improved process automation (RFIs/COs, automatic updated master budget, etc)
29/38	3.93/5	Improved information version control
37/38	3.84/5	Enabled better project/program control
36/38	3.61/5	Improved timely capture of design/construction decisions
37/38	3.57/5	Enabled fewer information bottlenecks
36/38	3.56/5	Enhanced working within virtual teams
32/38	3.47/5	Enabled quicker response to project status and budget
32/38	3.41/5	Improved quality of the output
28/38	3.29/5	Enabled better forecasting and control
35/38	3.26/5	Improved project relationships with strategic partners
30/38	3.20/5	Reduced rework/data reentry
34/38	3.06/5	Enabled better resource allocation; more effective assembly of project teams
22/38	3.05/5	Improved public relations
34/38	3.03/5	Reduced personnel costs due to improved efficiency
35/38	2.94/5	Improved idea sharing among team members/within organization
32/38	2.94/5	Minimized project/business risks
23/38	2.91/5	Enabled faster launch to market due to faster delivery
33/38	2.88/5	Reduced errors & omissions
23/38	2.87/5	Reduced delivery lead times
16/38	2.75/5	Enabled better inventory management
18/38	2.56/5	Enabled more effective identification and assessment of new suppliers
24/38	2.38/5	Enabled advance purchase of materials

lowest: 3.48
highest: 4.04
average: 3.72
18 benefits (out of 27)

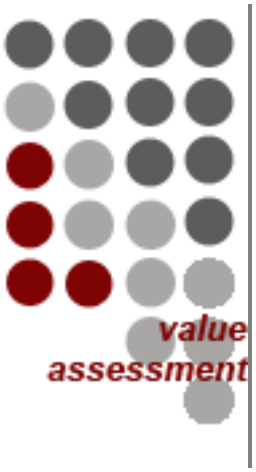
		Quasi-tangible Benefits (rating)	Intangible benefits identified	Cost/Margin/Rate
		3.94/5.00 **20 benefits** out of 27	*Not identified*	0.07% (considers 1st phase program)
Inscape Corporation "Supplier"	*Not considered*	**3.48/5.00** **12 benefits** out of 27	4 identified: Increased Sales, Market Advantage, Better Customer Relation, Negotiation Power	Pass the cost to the owner
ITG Group "Owner"	*Not considered*	**4.04/5.00** **21 benefits** out of 27	2 identified: Process Re-engineering, Realization of anonymous	(the cost includes development of the
Kitchell Contractors "GC/CM"	$42,000/year (10 projects)	**3.50/5.00** **15 benefits** out of 27	Not identified	Pass the cost to the owner
LA Unified School District "Owner"	*Not considered*	**3.80/5.00** **19 benefits** out of 27	2 identified: Forecasting, Risk Management	0.02% (1st phase program & includes
Manhattan Construction Company "GC/CM"	$59,000/year (18 projects)	**3.64/5.00** **14 benefits** out of 27	Not identified	0.04% (assumes the firm has projects every year)
Nationwide Building Society "Owner"	*Not considered*	**3.90/5.00** **25 benefits** out of 27	4 identified: Supply Chain Integration, Knowledge Management, Performance Measurement, Process Reengineering.	0.15% (the cost includes development of the software: PM & KM)
P.J. Dick Incorporated "GC/CM"	$47,100/year (10 projects)	**3.50/5.00** **20 benefits** out of 27	1 identified: Competitive Advantage	*'not released'*
TRM Healthcare "Owner"	$536,500/year (10 projects)	**3.65/5.00** **13 benefits** out of 27	*Not identified*	*'not released'*

Would loose:

- their control of the overall program,
- information availability to make valid decisions,
- advantage in resolving disputes,
- efficient communication and coordination,
- their ability to enforce the work flow and data population,
- individual's time,
- accountability and accessibility,
- ownership of the data,
- standardization throughout their projects.

Intangibles: new services

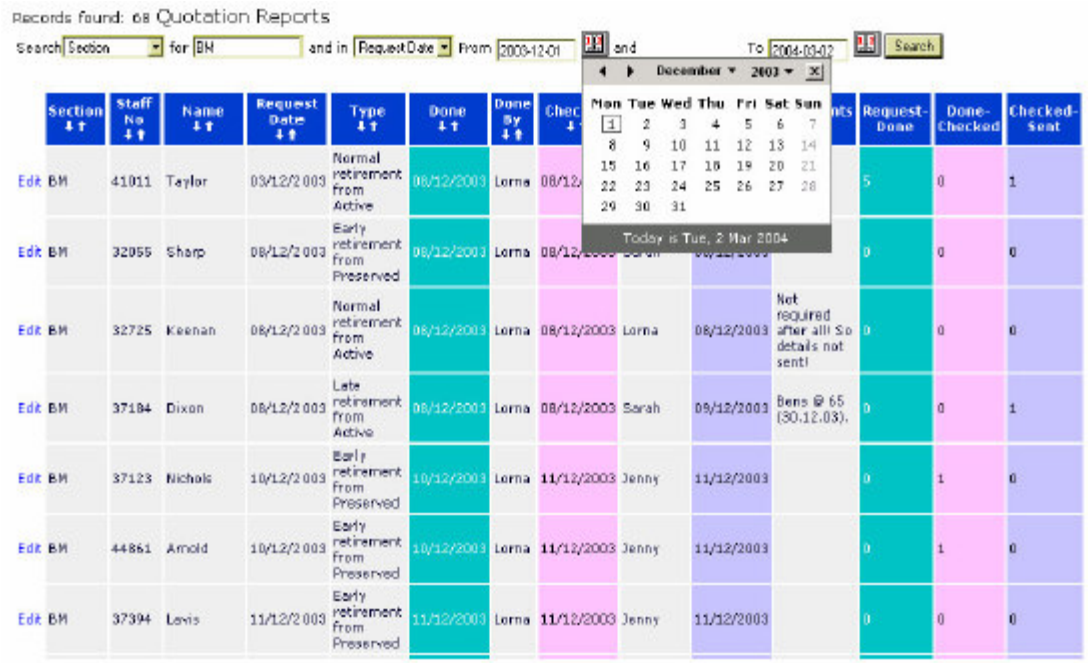
1. Supply Chain Integration
2. Performance Measurement



Intangibles: *new services*

main contractors performance; reward or reduce workload
benchmarking exercise
enable statistics/performance reports
e.g. final cost vs. budget costs
contractors can measure their own processes and make changes if needed

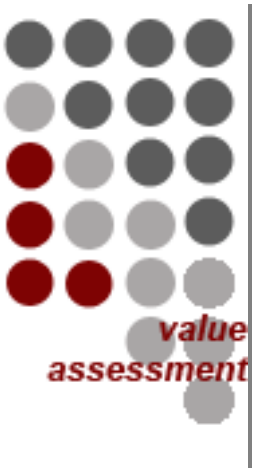
value assessment



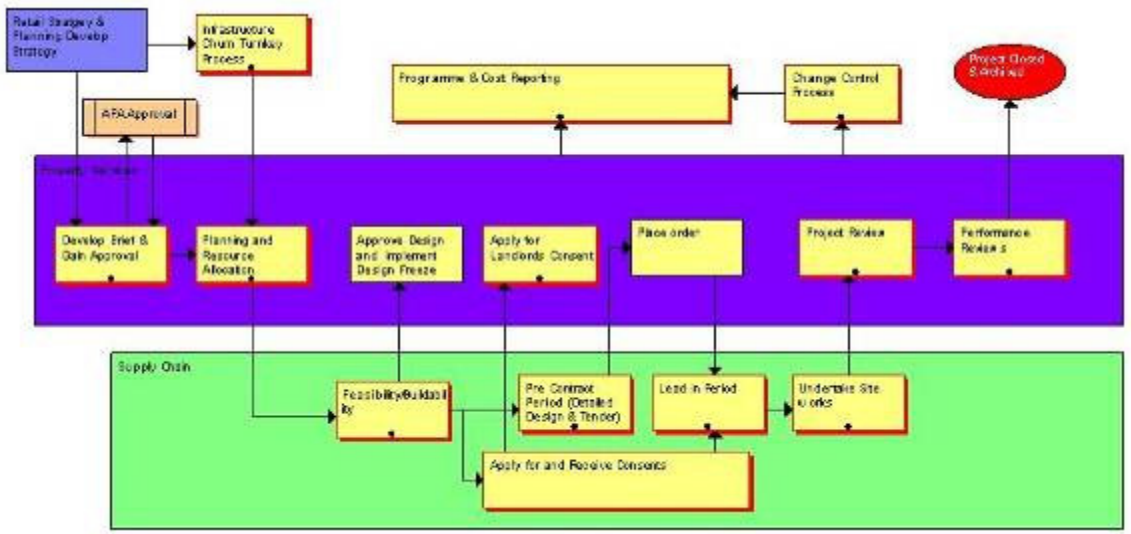
Run Reports on Progress and Calculate KPIs

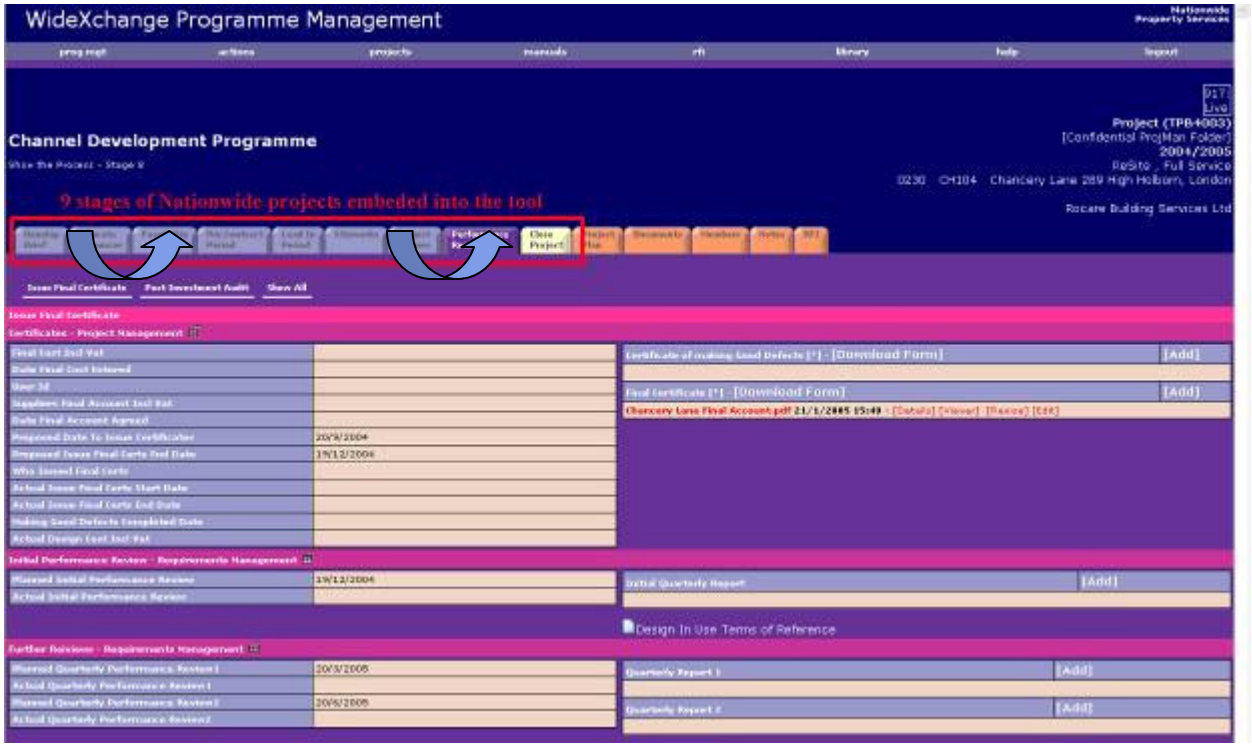
Intangibles: new services

1. Supply Chain Integration
2. Performance Measurement
3. Process Assessment & Reengineering; discovery and formalization of –extended- business processes



Intangibles: new services





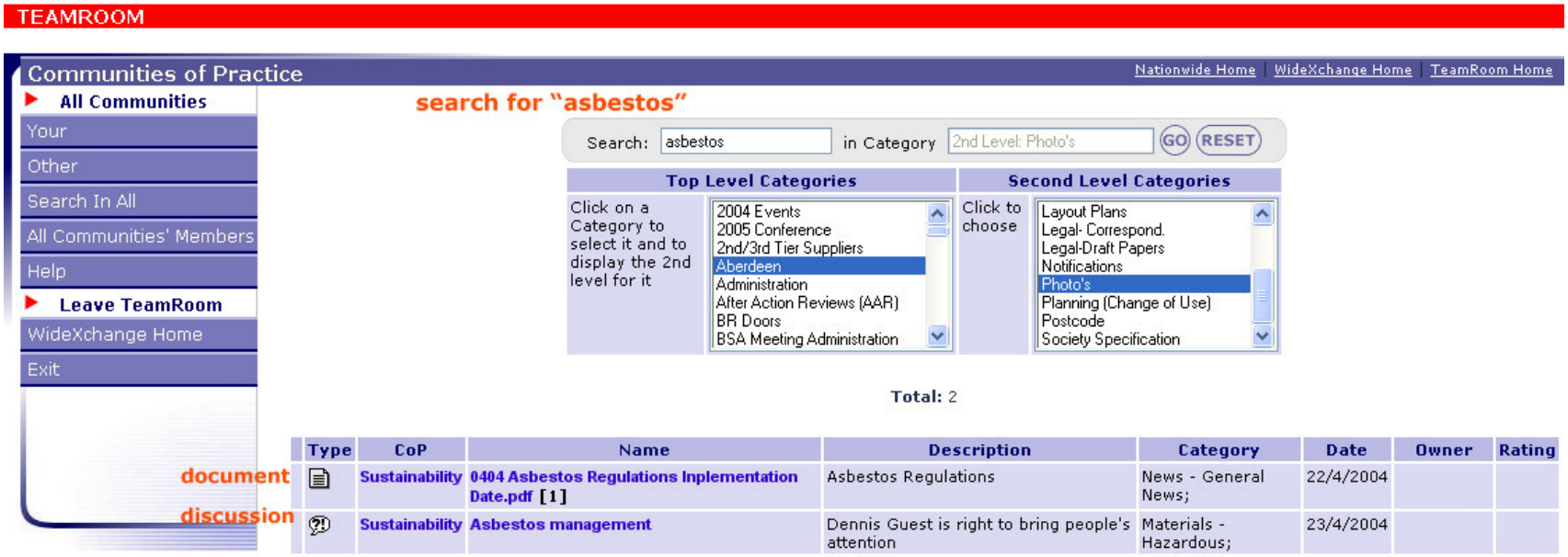
value assessment

Intangibles: new services

1. Supply Chain Integration
2. Performance Measurement
3. Process Reengineering
4. Knowledge Management

Intangibles: new services

helps to solve people's problems
specialty interests groups/projects built into the tool
q&a, discussion rooms, libraries
capture ideas/knowledge
find agendas, project/contact information, names/contacts of experts



Intangibles: new services

TEAMROOM

Sustainability - Community of Practice

Message 0 in thread

FROM: FAO:
SUBJECT: **Pest Control/Waste**
DATE: 2003-11-10 12:50:11.00
[rate] [reply]

BODY:
Following a recent audit, I highlighted that a couple of my pest control providers, as one of their practices, buried their pest waste in the grounds of their own premis. I have spoken with the Environmental Agency with regard to this subject and I am getting conflicting advice as to whether this is an illegal practice or not. I feel it is, and that Waste Disposal Licence and an approved waste disposal route is required. Has anyone else experienced this situation and, if so has it led to a conclusion and could you share this information with me.

"QUESTION"

Message 1 in thread

FROM:
SUBJECT: **RE: Pest Control/Waste**
DATE: 2003-11-14 12:50:38.00
[rate] [reply]

BODY:
We have looked into it previously during duty of care audits we carry out for BT. The conclusion we reached with some input from the local Environment Agency office was that the pest waste is 'waste' in respect of its legal definition and that Burial of pest waste is NOT an exempt activity from the waste management licensing regulations. Furthermore, clinical waste guidance may be applicable, depending on the nature of the waste. The Environment Agency web-site gives some guidance on pest control which indicates that the duty of care requirements certainly do apply [http://www.environment-agency.gov.uk/netregs/processes/417011/?version=1&sectorid=342719]. I hope this helps.

"ANSWER"

Additional Information

Message 2 in thread

FROM: FAO:
SUBJECT: **RE: Pest Control/Waste**
DATE: 2003-12-03 15:30:29.00
[rate] [reply]

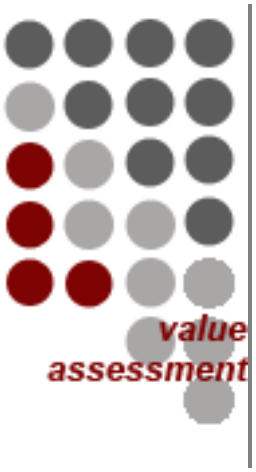
BODY:
Better late than never!

To clear up the fundamental point - no it is not illegal to bury rodenticide as a means of disposal - in fact most manufacturers list burn and bury as the two most common means of disposal.

Being a bit of a cynic I frankly do not believe people who say they bury rodenticide. Where do they bury it? In the garden? How big are these companies?

Intangibles: *new services*

1. Supply Chain Integration
2. Performance Measurement
3. Process Reengineering
4. Knowledge Management
5. Improved Company Image



when the argument is:
can you deliver the project without an OCPM solution?

"This technology do certain things when you do traditional process but when you are looking at hundreds and thousands of projects in a small span of time, then one has to look at the technology and nobly say how can we re-do the old process?"
Marek Suchocki, Research and Innovation Manager, Atkins Management Consultants

Intangibles: new services

Design proposal with photo montage

Photo Montage Exceptions

Add a Montage Exception

View Current Exceptions
View Amended Exceptions
View Archived Exceptions
View All Exceptions

reject

notification

approve

notification

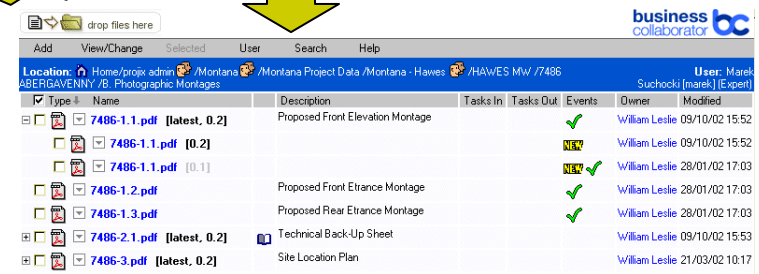
Montage Exceptions	
Prop. Ref	6611
Branch Name	Portsmouth Commercial F
File Name	MONT
Description	Previois option showing 515 flat faced fascia to be uploaded to projix as amendment to current uploaded montage.
Action Required	L&H to amend photo montage as per instruction. No requirement for Atkins to take any
Date Added	15/09/2003 381x569
Montage Amended	19 dd 09 mm 2003 yyyy
Action Taken	Amended montage sheet (1.1) & tech sheet uploaded. No further action required.
Approved	Yes
Owner	ATK

Last Edited By: Marek Suchocki
Last Edited On: 25/04/2003

Submit
Cancel and book in record

exceptions log

value assessment



<-- Montage Exceptions Menu

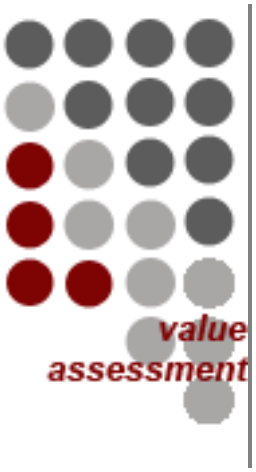
Found 1311 records. Showing records **1** - **30**. Jump to page: [prev] 1 [next]

Find items in All Fields that contain (phrase) Search

Prop. Ref	Branch Name	File Name	Description	Action Required	Date Added	Montage Amended	Last Edited By	Last Edited On	Owner
6611	Portsmouth Commercial Road	MONT	Previois option showing 515 flat faced fascia to be uploaded to projix as amendment to current uploaded montage.	L&H to amend photo montage as per instruction. No requirement for Atkins to take any further action as consent fro amended scheme already granted by LPA.	15/09/2003	19/09/2003	andrewcook	03/10/2003	ATK
3864	Glossop	MONT	Option required (Andrew) Front elevation individual lettering to be mounted on a blueberry backing panel. Panel to be sized to show gap in stonework above and below.	L&H to prepare option as per instruction and email to Andrew. Atkins to submit to LPA for approval as minor amendment.	15/09/2003	19/09/2003	andrewcook	03/10/2003	ATK
6611	Portsmouth Commercial Road	MONT	Option required - Andrew Fascia to be	L&H to prepare a full monatge option and email to Andrew. Atkins to submit	29/07/2003	04/08/2003	andrewcook	17/09/2003	ATK

Intangibles: new services

1. Supply Chain Integration
2. Performance Measurement
3. Process Reengineering
4. Knowledge Management
5. Improved Company Image
6. Gained/maintained Competitive Advantage



"In the Washington, DC region, we use the tool in more and more projects due to increasing contract requirements. There is more interest in its use from our clients, and how quickly we can place the tool is very important when we are doing some large projects."

Mike Parkinson, Project Manager, Manhattan Construction Company

Intangibles: *new services*

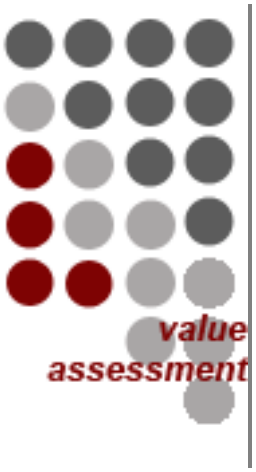
1. Supply Chain Integration
2. Performance Measurement
3. Process Reengineering
4. Knowledge Management
5. Improved Company Image
6. Gained/maintained Competitive Advantage
7. Gained Market Access
8. Improved Customer Relationships
9. Gained Negotiation Power
10. Increased Market Share; space and capacity for business growth

> *"The relations we build are far bigger than we could think about in the absence of this tool."*
> Atul Bali, Executive Vice President, Channel Management, Inscape Corporation

> *"Getting involved in the project sooner, this is one way that we can spark up in the conversation sooner. This is extremely important for our sales."*
> Dan Kennedy, Sales Analyst, Specification Coordinator

Intangibles: new services

1. Supply Chain Integration
2. Performance Measurement
3. Process Reengineering
4. Knowledge Management
5. Improved Company Image
6. Gained/maintained Competitive Advantage
7. Gained Market Access
8. Improved Customer Relationships
9. Gained Negotiation Power
10. Increased Market Share; space and capacity for business growth
11. Forecasting



Intangibles: *new services*

budget constraints and potential costs
project and master budget
cost codes are tied to the accounting system
anticipated costs vs. projected budget
what funds are available for each project and what has been spent to date in any given region?

value assessment

ANTICIPATED COST REPORT (ACR)

PHASE	Cost Code	BUDGET Current Budget (C)	Pending Revisions (D)	Estimated + Adjustments (E + F)	PROJECTED C + D + E + F (G)	COMMITMENTS Original Commitment (H)	Approved Revisions (I)	Pending Revisions (K)	Estimate to Complete (L + M)	ANTICIPATED H + I + K + L + M (N)	OVER / (UNDER) Anticipated Costs vs. Projected Budget (N - G)
2 ENVIRONMENTAL											
2.E.1-71	DTSC (DEPT TOXIC SUBSTANCES CONTROL)										
2.E.1-72	PEA (PRELIM ENVIRONMENTAL ASSESSMENT)										
2.E.1-73	RAW (REMOVAL ACTION WORK PLANS)										
2.E.1-74	RAP (REMEDIAL ACTION PLAN)										
2.E.1-75	CEQA (CALIF. ENVIRONMENT QUALITY ACT)										
2.E.1-76	AIR TOXICS										

"The single biggest benefit is that we can see where the trends are going and we have the power to do something before it is too late."

Charlie Anderson, LAUSD Program Manager

Intangibles: new services

1. Supply Chain Integration
2. Performance Measurement
3. Process Reengineering
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5. Improved Company Image
6. Gained/maintained Competitive Advantage
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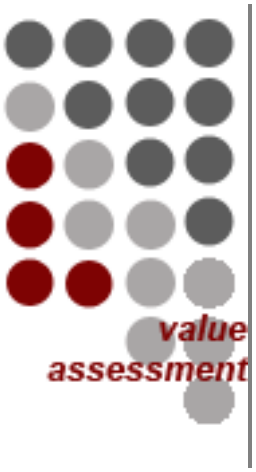
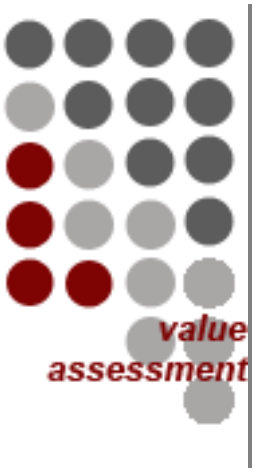
8. Improved Customer Relationships
9. Gained Negotiation Power
10. Increased Market Share; space and capacity for business growth
11. Forecasting
12. Claims Mitigation and Management



Intangibles: *new services*



"I was involved with a project in San Diego. We had everything in Primavera. This was the first series of heavy storms. The contractor have started the excavation but they actually lost part of their job site because of flooding. The questions came up about who is responsible for the erosion control. It was the time when most of files were displaced and some were destroyed. What we found out is during the pre-bid process, there was a significant RFI that came in from one of the contractors asking if erosion control is supposed to be in earth work contract. The response came back from the owner as it was. We didn't know that the same contractor who filed the claim wrote a letter stating that they wanted to verify that the erosion control would in fact be included in their contract control even though it wasn't stated in the bid documents. It was signed by the same gentleman who was filing the claim. The overall claim was about $300,000. The district paid $35,000 because we considered it as a natural disaster. ***That one claim itself paid for the entire system****."*

David Page, Facilities Information Systems, LAUSD

Case Name	Tangible Benefits ($)	Quasi-tangible Benefits (rating)	Intangible Benefits (identification)	Cost/Program Ratio
Indianapolis Public Schools *Owner*	**$59,000/year** (10 projects)	**3.94/5.00** **20 benefits** out of 27	*Not identified*	**0.07%** (considers 1st phase program)
Inscape Corporation *Supplier*	*Not considered*	**3.48/5.00** **12 benefits** out of 27	**4 identified:** Increased Sales, Market Access and Expose, Better Customer Relation, Negotiation Power.	Pass the cost to the owner
ITG Group *Owner*	*Not considered*	**4.04/5.00** **21 benefits** out of 27	**2 identified:** Process Reengineering, Realization of ambitious schedule.	**0.1%** (the cost includes development of the software)
Kitchell Contractors *GC/CM*	**$42,000/year** (10 projects)	**3.50/5.00** **15 benefits** out of 27	*Not identified*	Pass the cost to the owner
LA Unified School District *Owner*	*Not considered*	**3.80/5.00** **19 benefits** out of 27	**2 identified:** Forecasting, Risk Management.	**0.02%** (considers 2nd phase program & includes develop. fees)
Manhattan Construction Company *GC/CM*	**$59,000/year** (18 projects)	**3.64/5.00** **14 benefits** out of 27	*Not identified*	**0.04%** (assumes the firm has at least 4 $100mil. projects every year)
Nationwide Building Society *Owner*	*Not considered*	**3.90/5.00** **25 benefits** out of 27	**4 identified:** Supply Chain Integration, Knowledge Management, Performance Measurement, Process Reengineering.	**0.15%** (the cost includes development of the software: PM & KM)
P.J. Dick Incorporated *GC/CM*	**$47,100/year** (10 projects)	**3.50/5.00** **20 benefits** out of 27	**1 identified:** Competitive Advantage	*'not released'*
TRM Healthcare *Owner*	**$536,500/year** (10 projects)	**3.65/5.00** **13 benefits** out of 27	*Not identified*	*'not released'*

Case Name	Tangible Benefits ($)	Quasi-tangible Benefits (rating)	Intangible benefits (identified)	Cost/Program Ratio
Indianapolis Public Schools "Owner"	$59,000/year (10 projects)	3.94/5.00 20 benefits out of 27	*Not identified*	**0.07%** (considers 1st phase program)
Inscape Corporation "Supplier"	*Not considered*	3.46/5.00 12 benefits out of 27	4 identified: Increased Sales, Market Access and Exposa, Better Customer Relation, Negotiation Power.	Pass the cost to the owner
ITG Group "Owner"	*Not considered*	4.04/5.00 [illegible]	2 identified: [illegible] Realization of ambitious schedule.	**0.1%** (the cost includes development of the software)
Kitchell Contractors "GC/CM"	$42,000/year (10 projects)	3.50/5.00 15 benefits out of 27	*Not identified*	Pass the cost to the owner
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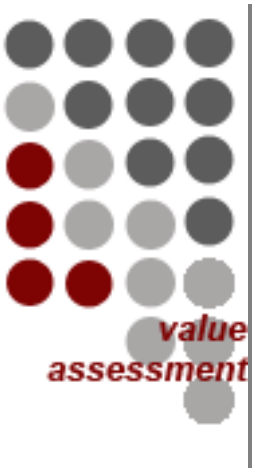
TRIM Healthcare "Owner"	$536,500/year (10 projects)	3.65/5.00 13 benefits out of 27	*Not identified*	*'not released'*

- Commercially sensitive
- Highest cost/program ratio = ***0.15%*** (includes customization)
- Lowest cost/program ratio = ***0.02%***

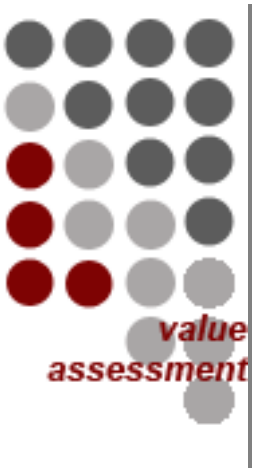
Enhancements:



- Robust tools should fit the nature of projects
- Flexible tools with customizable modules
- Intelligent Workflows
- Object based as opposed to document based
- Cross-referenced objects
- Capturing Paper Documents
- Ease of Use
- Desktop Integration
- Interoperability
- Strong Management Support + Training and Contractual Requirement

Trends:

- Convinced that OCPM technology is invaluable and becoming a standard way
- "It is not only the technology!" and "the next big step is the implementation!";
  - Overcoming change and cultural barriers
  - Matched processes
  - Integration of OCPM solution with key software
  - Training, mandating, supporting the implementation
- Extended use:
  - More modules used by more collaborators
  - Easily reusing and reconfiguring the OCPM solution
  - Using the knowledge collected



Who are the major buyers of OCPM technology?

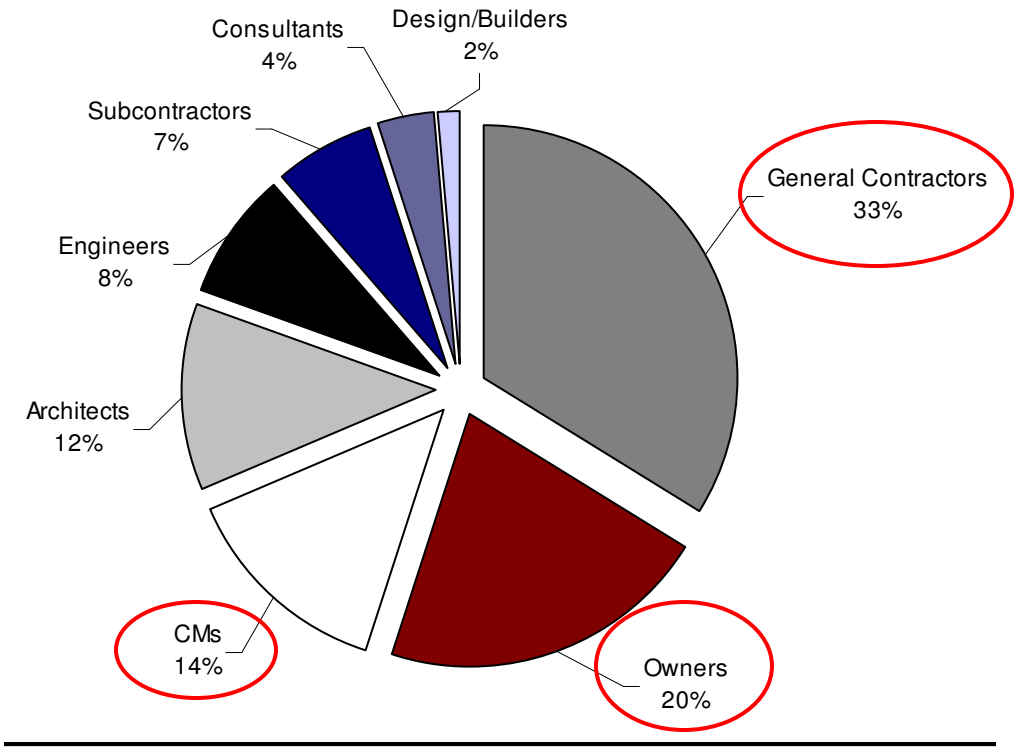
- **Long-term Owners** whose core business is not construction but who *KEEP* the building

  e.g. banks, pharmaceutical companies, schools, automobile manufacturers …

- Large and mid-size **General Contractors**

  e.g. Bechtel, PJ Dick, Kitchell …

Who invests on OCPM technology?



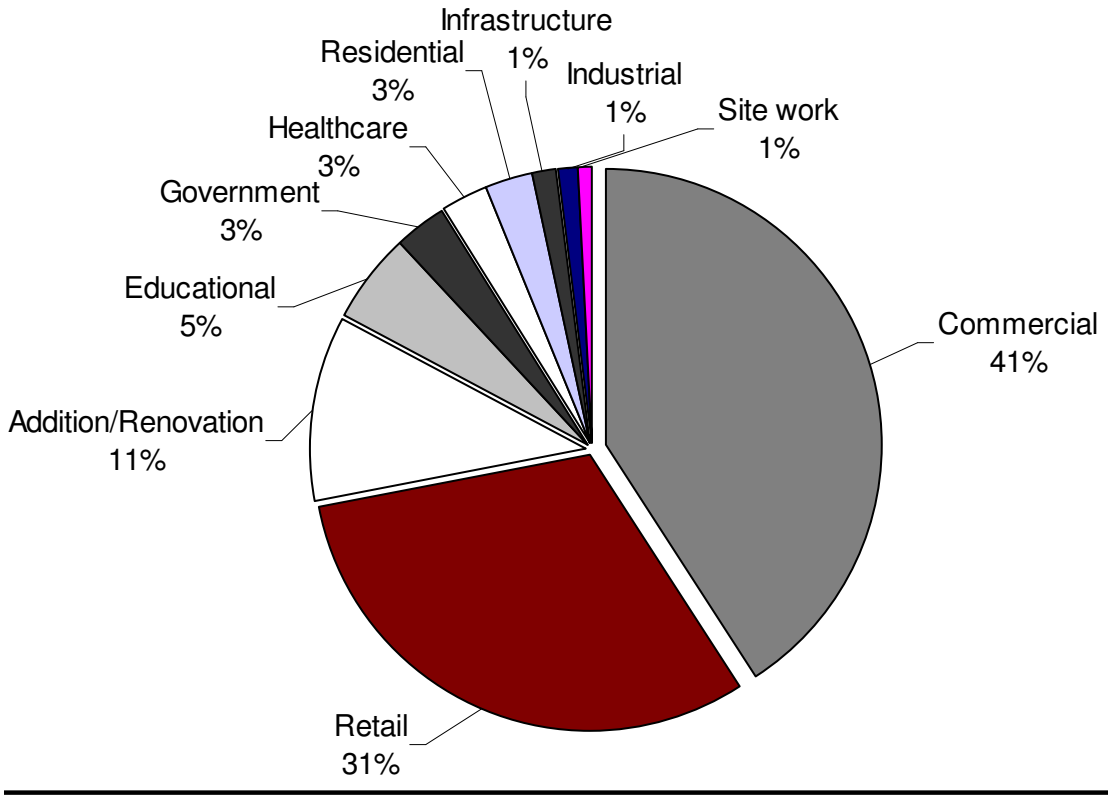
Clients of OCPM technology providers by count – based on 46,500 projects (*sponsor aggregate data)

Implementation Practices

Why don't subcontractors and suppliers use OCPM technology?

- "In general", they are **not given access** to the systems; cost and security
- They are **not technology savvy**
- Usually **benefits overpass them**; one cannot see the others work progress, etc
- They are **not permanent** in the project; their role is limited

What types of projects are managed by OCPM tools?



Project types – based on ~ 17,900 projects (*sponsor aggregate data)

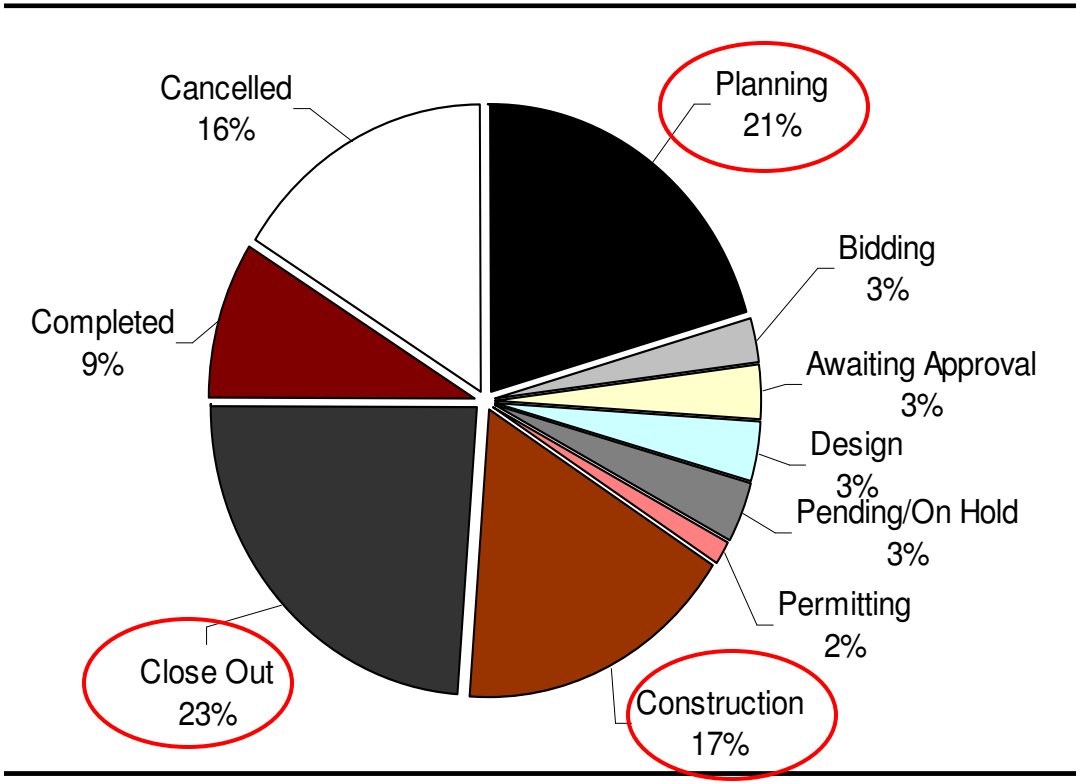
Implementation Practices

Is OCPM technology more favorable for multiple and repetitive projects?

- **Owner control** over projects/program across projects, stop/divert problems
- **Set standards** for repetitive projects; e.g. renovations
- **Customize** the OCPM tool according to your needs
- **Negotiate the cost** of the OCPM technology; economies of scale
- **Learn** from the mistakes / other peoples' experiences
- **Effective coordination** of sheer number of participants

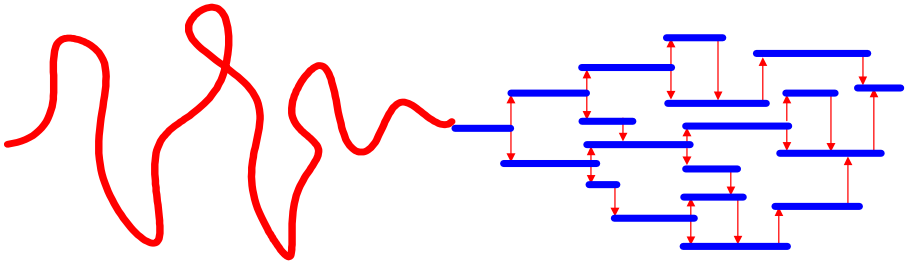
In which project stage OCPM tools are used most?

Implementation Practices



Project status – based on ~ 30,000 projects (*sponsor aggregate data)

Why is OCPM technology used more the construction?

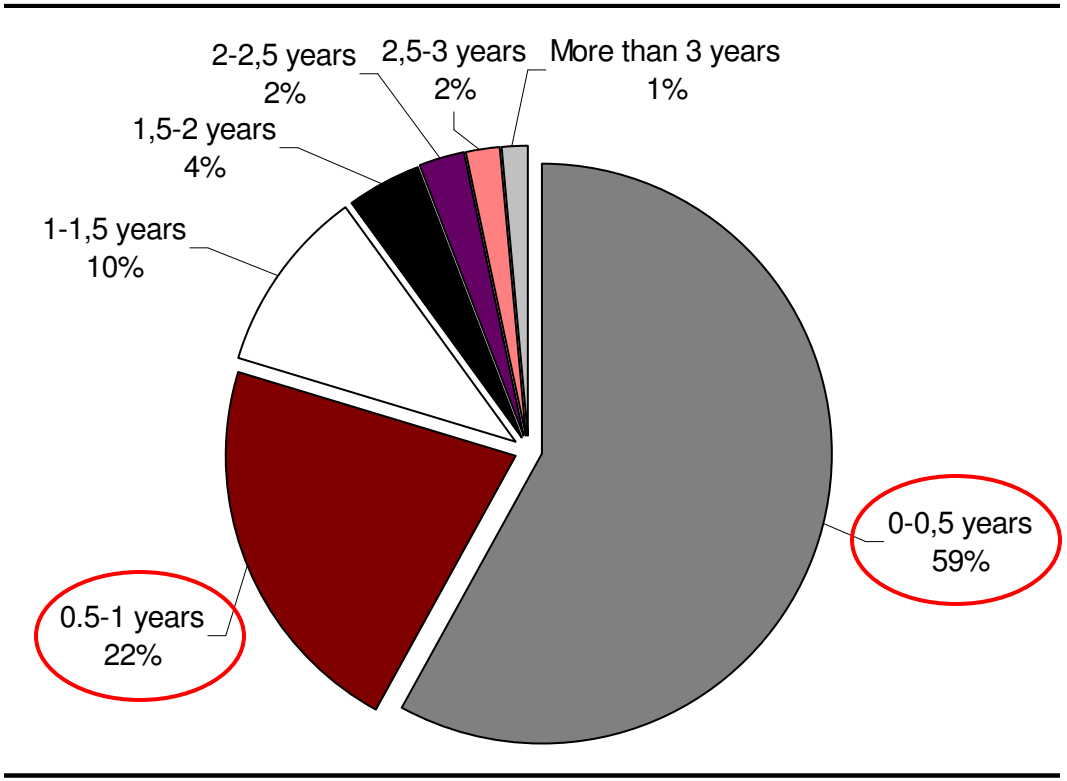


Implementation Practices

DESIGN:
- architects don't want the owner to monitor
- few players collaborating
- design process is fluid and it is not hieratical
- tools are enough; you don't need any more functionality

CONSTRUCTION:
- information is in one place
- control dissemination of the information
- communication is transparent
- many parties who execute orders are involved; they are not equal
- interdependencies of the parties
- forces accountability
- small KM depository
- there is a record of the project

What is the average duration of use?



Implementation Practices

Average duration of use per project – based on ~ 5,700 projects (*sponsor aggregate data)

Average duration of usage is 8.2 months

Selection process:

Carried out by **consultants**, owner's **project/program managers** and/or organization's **technology department**

1st: **Web-based** vs. **web-enabled**: firewalls, security, sensitivity, resources
2nd: **Vendor**: responsiveness, company stability, system integrity, training availability

Sometimes: Request for Quotation
Mostly: Demonstration or Testing
Always: Recommendations

The cost:

- **Sensitive issue**
- **Renewed** 3-5 year contracts
- **Unlimited** number of users, space, projects
- No **industry standard**
  - Subscription base
  - License + maintenance
  - Negotiated fix cost
  - Exclusive business partnership agreement

Implementation:

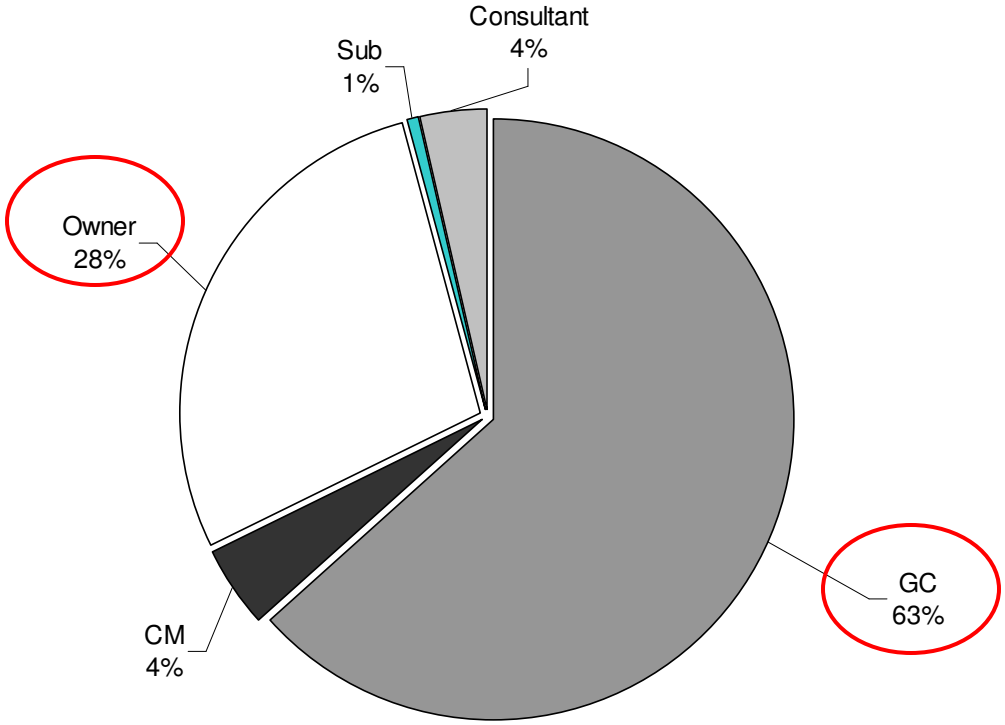
Investors work with the vendor/consultants to **customize**/ **tailor** the tool to **match the process**

Testing, workshops, analysis and evaluation/enhancement

Owner/GC:

- **Contractually mandates** the use and training
- Provides **free access** and **training**

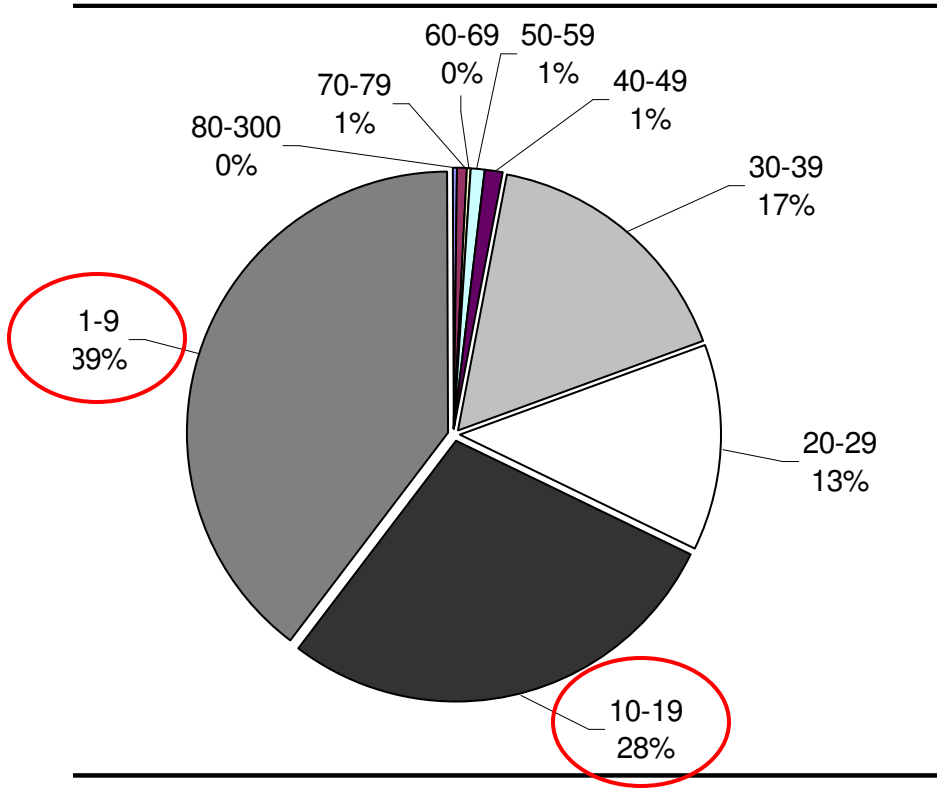
Who uses OCPM technology?



Client type by unique logins based on ~ 21,000 projects (*sponsor aggregate data)

Implementation Practices

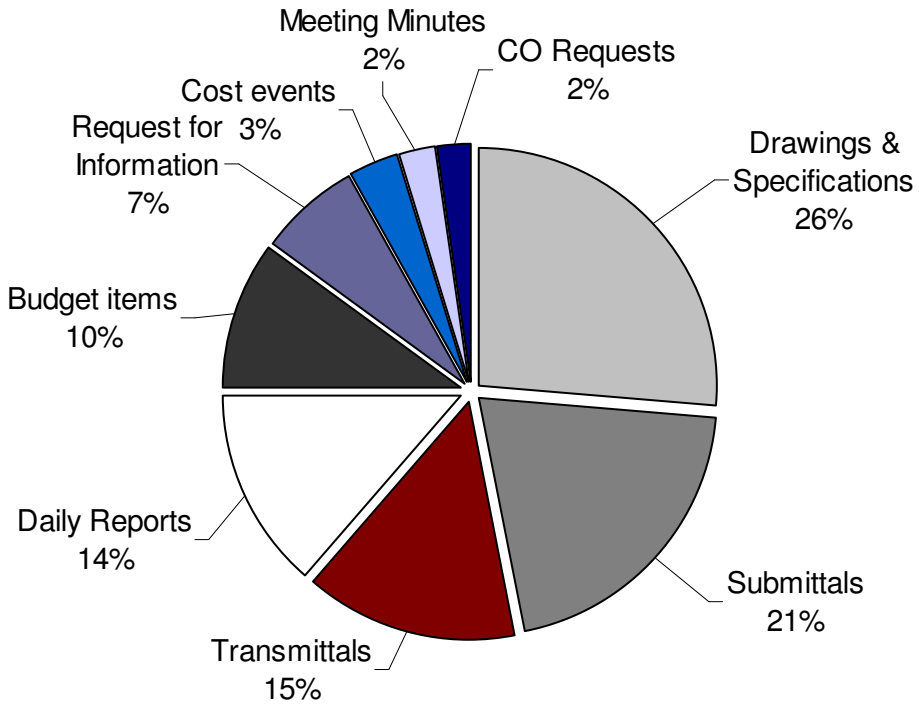
How many users per project do collaborate?



Active user numbers per project based on ~ 46,600 projects (*sponsor aggregate data)
Average number of users per project is 13.3 persons

Implementation Practices

What are the most used modules?



Types of entries – based on ~ 46,000 projects (*sponsor aggregate data)

Implementation Practices

Success:

- Strategic implementation plans
- Vision, commitment and re-engineering
- Make proactive arrangements: Champion
- Factor the solution early on
- Develop business processes built into solution's capabilities
- Culture, planning and control style, organizational size and structure
- Contractually mandate use and training
- Continual performance monitoring
- Responsive technology provider