

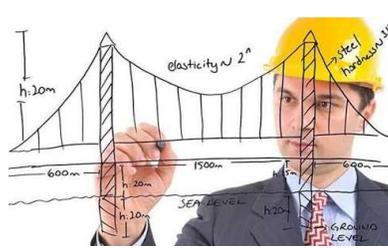
# Interactive communication in Value Management Workshops

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## Introduction

- VM team often composes of multidisciplinary members with different professional backgrounds (e.g., architects, structure engineers, etc.) from various companies.



Sometimes, they may even come from different cities and regions.



## Introduction

- The traditional form of communication during VM studies is directly **face to face**.
- It includes data exporting and importing processes via different formats (e.g. Text, diagrams, etc.)



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## Introduction

- It is really hard to coordinate all VM team members' schedules at the same time in the same place for the VM workshop, especially for mega construction projects due to the long distance among their locations.
- All of those create **obstacles** in the VM practices.



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## Introduction

- VM encouraging **positive communication** among VM team members is beneficial in establishing team spirit and accelerating the arrival of consensus among stakeholders. All decisions and recommendations are made through communication.



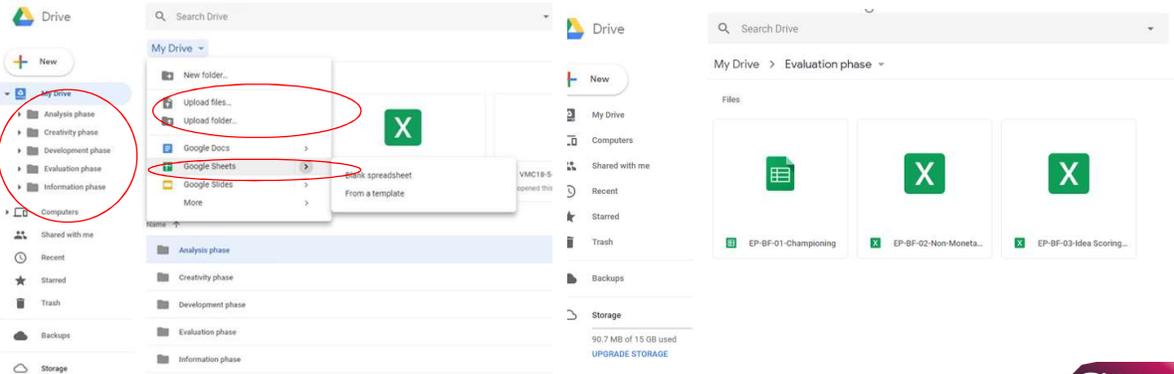
- **A suitable communication platform and communication environment** are, thus, the basis for the smooth implementation of the VM workshop.



## Introduction

**Google Sheet** is a proper *computer-based online spreadsheet* allowing users to create and format spreadsheets and, simultaneously, work with other people.

1. a set of VM worksheets for various phases (e.g. information, analysis, creativity, evaluation, and development) has to be uploaded to the Google Drive under various folder.



## Introduction

2. Apart from the information (e.g., functions, ideas, etc.) saving and sharing, team members can also vote and write down any comments to convince other team members during the discussion. Finally, a champion Google sheet is accomplished.

Function(s)	No.	Verb-Noun	Description	YU	HAN	WEI	WANG	EMILY	YUAN	XU	Total Score	Rank
	1		Equip handrails for disabled	1							1	5
	2		Barrier-free elevator for people with mobility								1	4
	3		Barrier-free entrance								1	4
	4		Well-designed pedestrian circulation								1	4
	5		escalator								1	4
	6		Accessible toilet								1	4
	7		Button operated door								1	4
	8		Automatic sensor door								1	4
	9		Wheelchair ramp								1	4
	10		Build enough corridors to connect room								1	4
	11		Adequate lighting on night								1	4
	12		Slip resistant surface								1	4
	13		Equip blind tracks for the blind								1	3
	14		Set up reception area for visitors								1	3
	15		Protection edge								1	3
	16		Place signs for all categories properly								1	3
	17		Wheelchair access, the passage is provided for the convenience of wheelchair users								1	3
	18		Low-height service facilities								1	3
	19		Handrail on ramp								1	3
	20		Edge induction system								1	3
	21		Floor-mounted exit sign								1	3
	22		Sound control guide device								1	2
	23		Path edges should be clearly defined with changes in								1	2
	24		Set up safety grab bar								1	2
	25		Install handrails in the corridor								1	2
	26		Indoor anti-slip fine concrete ramp								1	2

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## Objective

- To investigate the impact of the application of online Google Sheets on the team decision making process in the VM workshops
- To investigate the effects of three communication modes (i.e., face to face communication, online communication, and both face to face and online communication) between various team members on the performance of VM workshops (function analysis, creativity, and evaluation).



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## Conceptual model

### Communication type

- Face to face
- Face to face & Online
- Online

### VM Process

- Information phase
- Function analysis phase
- Creativity phase
- Evaluation phase

### Workshop Satisfaction

- Sufficient information exchange
- Without time constraint
- Without location constraint
- Convenient communication



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## Methodology

**An intervention study** was conducted. 90 respondents were invited to join **three different groups** with the application of three different communication methods in the VM workshop:

- (1) Face to Face group
- (2) Face to Face and Online
- (3) Online group



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## Methodology

A **questionnaire survey** was conducted to the workshop participants in all three groups. The questionnaire consisted of three main parts:

- (1) Background information;
- (2) 16 items related **to the information, function analysis, creativity, and evaluation phase**;
- (3) 4 items related to the **overall workshop satisfaction**.

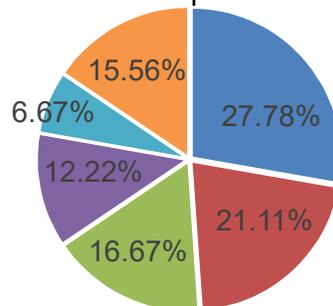
To compare the satisfaction of VM process (e.g. Information, function analysis, creativity and evaluation phase) with the three different communication methods, **a one-way between-groups ANOVA** and **a post hoc test** have been adopted in this study.



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## Results and Discussion-Back ground information

The respondents were selected from different professional backgrounds.



- civil engineers
- project managers
- hydraulic engineers
- quantity surveyors
- architects
- others

The respondents with over 10 years work experience are 25.56%. Over 79 respondents (89%) had a bachelor's degree or above, while male to female ratio is about 4 to 6. All of them participated in a certain kind of VM workshop before.



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## Results and Discussion-Satisfaction of workshop items

Item	Description	Group	Mean	SD	F	Sig
<b>Information phase</b>						
S1	Presented the design /product/process concept	FTF	4.97	.890	9.564	.000
		FTF and online	5.70	.837		
		Online	<b>5.83</b>	.847		
		Total	5.50	.903		
S2	Seek out evidence to confirm opinions	FTF	4.53	1.279	31.945	.000
		FTF and online	5.83	.834		
		Online	<b>6.40</b>	.498		
		Total	5.59	1.270		
S3	A collective file of project information was created	FTF	4.43	1.278	33.732	.000
		FTF and online	5.17	1.117		
		Online	<b>6.57</b>	.504		
		Total	5.39	1.347		

The online communication can remove the barriers caused by time and location, so they can easily share the information like Presenting the design /product /process concept (S1), Seek out evidence to confirm opinions (S2), and they also can created a collective file for information easily(S3).



## Results and Discussion-Satisfaction of workshop items

Item	Description	Group	Mean	SD	F	Sig
<b>Creativity phase</b>						
S9	Emphasized the number of ideas when generating ideas	FTF	4.60	1.003	14.303	.000
		FTF and online	5.30	.750		
		Online	<b>5.80</b>	.847		
		Total	5.23	.995		
S10	Exchanged ideas between different team members	FTF	3.73	1.760	27.876	.000
		FTF and online	5.03	.809		
		Online	<b>6.10</b>	.885		
		Total	4.96	1.557		
S11	Anonymous ideas	FTF	2.97	1.402	95.933	.000
		FTF and online	4.90	.809		
		Online	<b>6.50</b>	.885		
		Total	4.96	1.557		
S12	Time limitation to stimulate creativity	FTF	3.13	.147	60.079	.000
		FTF and online	6.07	.151		
		Online	<b>6.10</b>	.317		
		Total	5.10	.194		

In the creativity phase, VM team can easily exchanging ideas and make anonymous ideas between different team members and make more ideas in the online environment without time limitation.



## Results and Discussion-Satisfaction of workshop items

Item	Description	Group	Mean	SD	F	Sig
Evaluation phase						
S13	Requested participants to combine similar ideas within categories	FTF	4.97	1.629	6.629	.002
		FTF and online	5.80	1.095		
		Online	<b>6.07</b>	.785		
		Total	5.61	1.203		
S14	Requested participants to vote/score ideas for evaluation of the ideas	FTF	4.50	1.548	29.864	.000
		FTF and online	5.93	.740		
		Online	<b>6.50</b>	.509		
		Total	5.64	1.327		
S15	Each participant was encouraged to mark the idea individually at the same time	FTF	2.90	1.398	105.737	.000
		FTF and online	4.97	.850		
		Online	<b>6.60</b>	.498		
		Total	4.82	1.809		
S16	Individual work to score different ideas without persuasion influence	FTF	3.07	1.53	45.471	.000
		FTF and online	4.53	1.167		
		Online	<b>6.03</b>	.809		
		Total	4.54	1.704		

In the evaluation phase, online environment can help team members vote and score ideas easily without the limitation of time and location.



## Results and Discussion-Satisfaction of workshop items

**Google Sheet** does not only record the data, but also an information sharing platform simplifying the whole VM study, especially, information, creativity, and evaluation phases, without delay.

All VM team members can update the **information efficiently**, **get feedback** and **make comments simultaneously**, while the end users do not need to maintain the software program with extra cost. It enables geographically remote users to interact and collaborate in the workshops without traveling (Hatem et al, 2012).



## Results and Discussion-Satisfaction of workshop items

Item	Description	Group	Mean	SD	F	Sig
<b>Function analysis phase</b>						
S4	Used function analysis or FAST diagram to identify functions	FTF	6.20	.805	3.235	.044
		<b>FTF and online</b>	<b>6.60</b>	.498		
		Online	6.47	.507		
		Total	6.42	.636		
S5	Requested participants to define functions with verb-noun phases	FTF	5.93	.785	6.911	.002
		<b>FTF and online</b>	<b>6.50</b>	.509		
		Online	6.33	.479		
		Total	6.26	.646		
S6	Asked "why" and "how" questions to identify functions of the project	FTF	6.00	.830	8.142	.001
		<b>FTF and online</b>	<b>6.60</b>	.498		
		Online	6.33	.507		
		Total	6.38	.680		
S7	Function cost was easily calculated after we decided the weight of each function each component performed	FTF	4.23	1.547	19.141	.000
		FTF and online	5.17	.913		
		Online	<b>6.03</b>	.765		
		Total	5.14	.337		
S8	Red dots used to select mismatch functions and further mismatch analysis	FTF	5.50	1.119	11.864	.000
		<b>FTF and online</b>	<b>6.57</b>	.504		
		Online	6.50	.509		
		Total	5.26	.855		

Function cost was easily calculated by Google sheet after we decided the weight of each function and each component performed.

**Face to face** communication is still necessary for the functions analysis such as function identification, FAST diagram and mismatch function analysis.



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## Results and Discussion-Satisfaction of overall workshop

Item	X	Y	Mean Diff	SE	Sig.
D1	Specific information being exchanged were sufficient	FTF and Online	-1.800	.257	.000
		Online	-2.433	.217	.000
D2	Every participant's time is not different from other each other	FTF and Online	-1.033	.350	.007
		Online	-2.567	.356	.000
D3	No location constrains for VM participants	FTF and Online	-2.467	.245	.000
		Online	-3.967	.205	.000
D4	Internet makes communication much more convenient	FTF and Online	-.633	.250	.042
		Online	-2.067	.221	.000

According to the Post test results, online communication can significantly improve the satisfaction of information sharing ,remove the barriers of remote location and time and facilitate the communication.



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## Recommendation

- VM facilitators and all stakeholders fully utilize the online Google Sheets
- Proper internet training for VM facilitators and the team members is also required.
- Group team members physically together apply the pre-set online Google worksheets to identify and analyze functions by the FAST diagram. The other members in remote distance can reverse the function table and the FAST diagram by Google sheet and express their opinion by online chatting.
- As Google Sheet does not have the function of instant communication, it is suggested to use the developed web-based 'interactive value management internet' (ivmi) (Leung, 2012) or the online chatting software to support the virtual workshops.



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## Conclusion

- In this paper, the different communication methods among team members in the information, function analysis, creativity and evaluation phases have been analyzed through an intervention study (3 groups).
- The result reveals that online communication software can significantly support communication in the whole VM process in terms of information sharing, flexible time, unconstraint location, and overall convenience.
- Apart from function analysis, the satisfaction levels of items related to the information, creativity and evaluation phases in the online group are all higher than those in the face to face group and the face to face plus online group.
- It is recommended to fully utilize the online Google Sheets *plus* the developed *ivmi* program and/or audio /video devices for virtual face to face communication in the function analysis.



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## Reference

Leung, M. Y. (2011). Development of a web-based tool to advance the function analysis in value management. *In SAVE International® 51st Annual Conference Proceedings, 'Value at the Trail's End'*.

Hatem, W. A., Kwan, A., & Miles, J. (2012). Comparing the effectiveness of face to face and computer mediated collaboration. *Advanced Engineering Informatics*, 26(2), 383-395.

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Q&A

