

Visualization for Ensuring the Efficiency of IT Audit

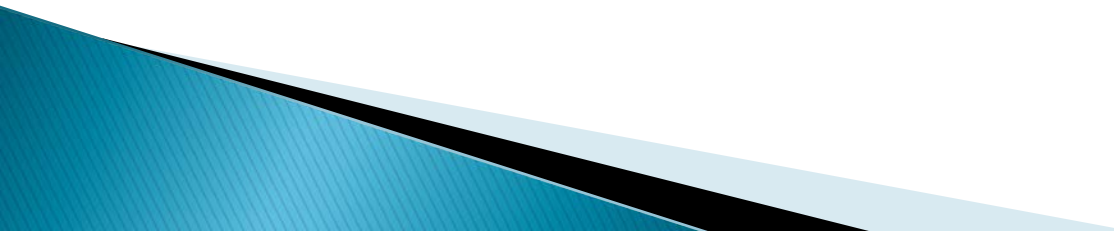


Jinwon Ho
The Board of Audit and Inspection of Korea

- ▶ IT Environment
- ▶ Operational Performance of Information Systems
- ▶ Importance
- ▶ Issues
- ▶ Measurement Criteria
- ▶ Visualization
- ▶ Data Visualization Cases
- ▶ Screen shots
- ▶ Implications



IT Environment

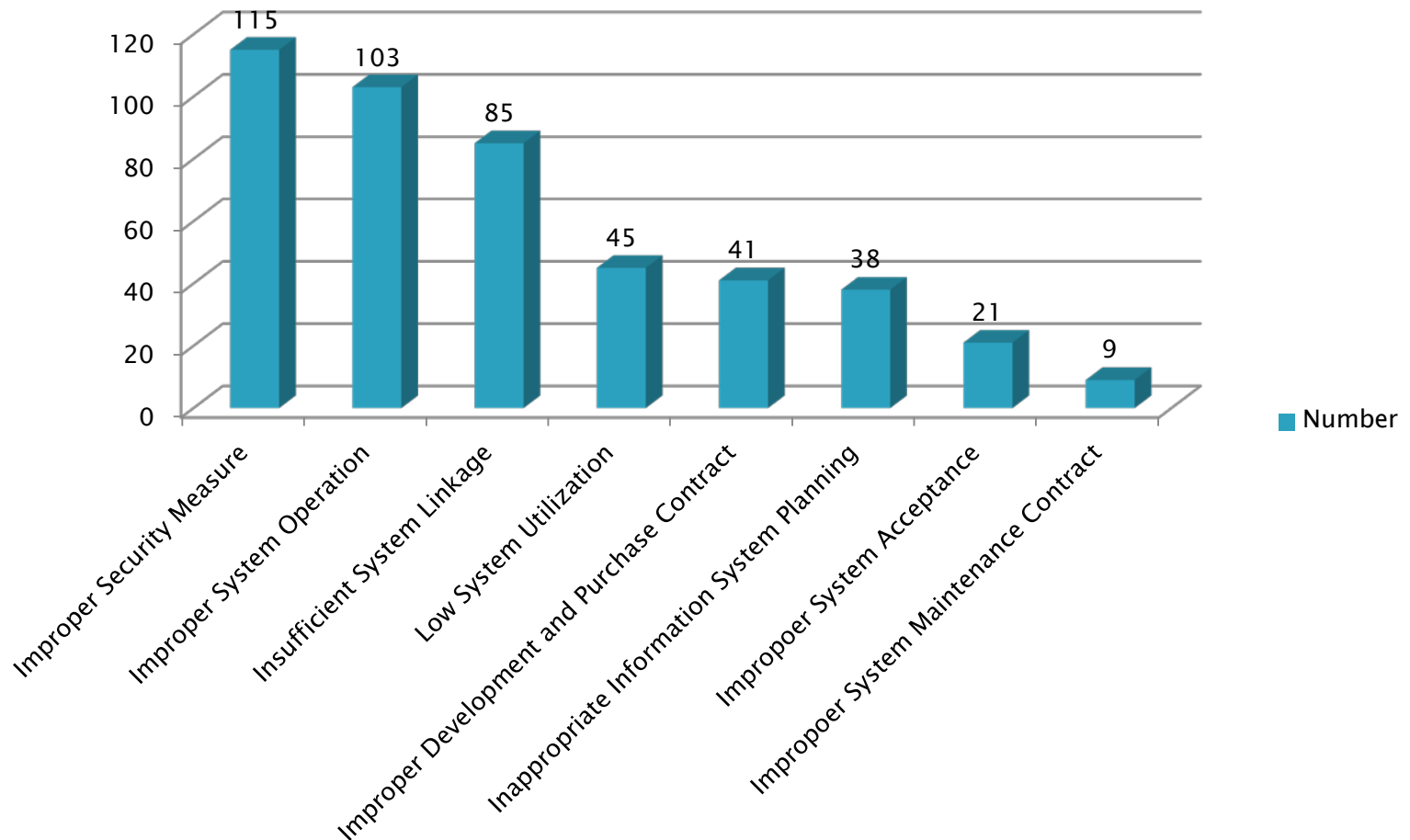
- ▶ Continuous increase in IT investment
 - ▶ Interest in the utilization performance of information systems
 - ▶ Needs continuous monitoring system
 - ▶ Requires measurements of operational performance of information systems
- 

Operational Performance of Information Systems

- ▶ Measuring the performance based on criteria for determining the operational validity of the information systems
 - “Guidelines of operational performance management information system”
- ▶ Successful IT investment is regarded as ensuring the utilization of information systems so that management of information systems is more important than just building of information systems
- ▶ Operational effects of the information system is to maximize the efficient and effective use of information resources

Importance of Operational Performance of Information Systems

- ▶ Results of IT audit cases by BAI in the past three years



Issues in Information Systems Operation

- ▶ Scattered criteria and methods of measuring information systems operation in multiple guidelines
- ▶ Difficulty of using data through Government-wide Enterprise Architecture (EA) Portal



Issues in Information Systems Operation

- ▶ Government-wide EA Portal
 - Review of duplication, overlap, integration between information systems
- ▶ But,
 - Current classification system is complex and it is characterized by agencies so that comparisons between agencies are difficult



Measurement Criteria

Operational Performance of Information systems

System Effectiveness

System Efficiency

System Utilization

- Average CPU Utilization
- Average Memory Utilization
- Amount of Information

Maintenance

- Cumulative Maintenance Cost Ratio
- The rate of increase/decrease in input operation and maintenance cost
- The rate of increase/decrease in average operation and maintenance cost

Efficiency of Information Resources

- Number of DB table columns
- Number of heterogeneous Database
- Number of older versions of Database

Interoperability

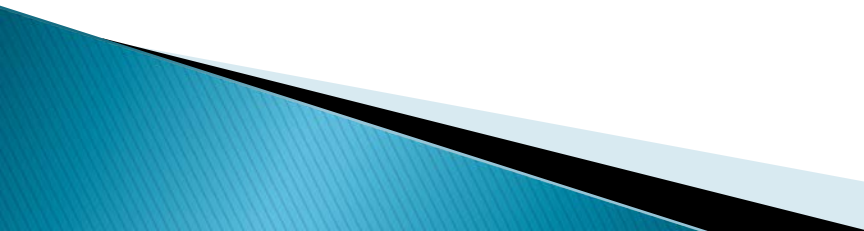
- Linkage between systems
- Linkage of systems between agencies
- Linkage methods(e.g. EAI, API)
- Duplication of systems

What You See
Is What You Get

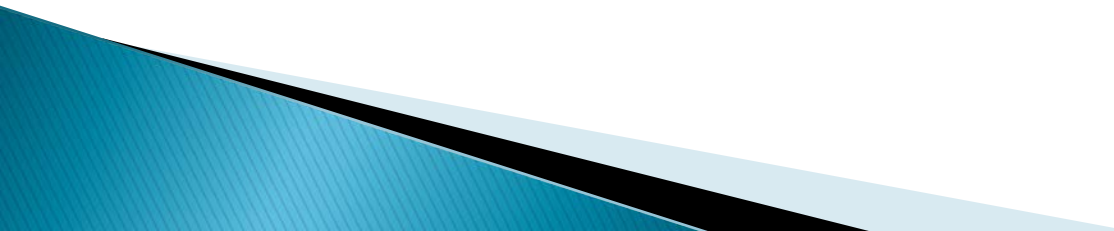
How do we
visualize?

A yellow rectangular sign with a black border and rounded corners is mounted on two silver poles. The sign is set against a blue background that features a bright light flare at the top center. The sign contains the text 'How do we visualize?' in a bold, black, sans-serif font.

Visualization

- ▶ A de-facto standard as means for strategic decision making
 - ▶ Presents information in ways that engages the use of the human's cognitive and visual abilities
 - ▶ Helps auditors gain better insights, draw better conclusions and ultimately improve the audit process
 - Reduces analysis efforts in rapid manner without manipulating underlying data
- 

Data Visualization Cases

- ▶ (USA) Office of Management Budget
 - ▶ (Japan) Cabinet Secretariat, Information and Communication Technology Strategy Office
 - ▶ (UK) National Audit Office
 - ▶ (Australia) Victorian Auditor-General's Office
- 

Screenshot(Overall Status)



감사연구원

AUDIT AND INSPECTION
RESEARCH INSTITUTE

[종합현황]



종합현황

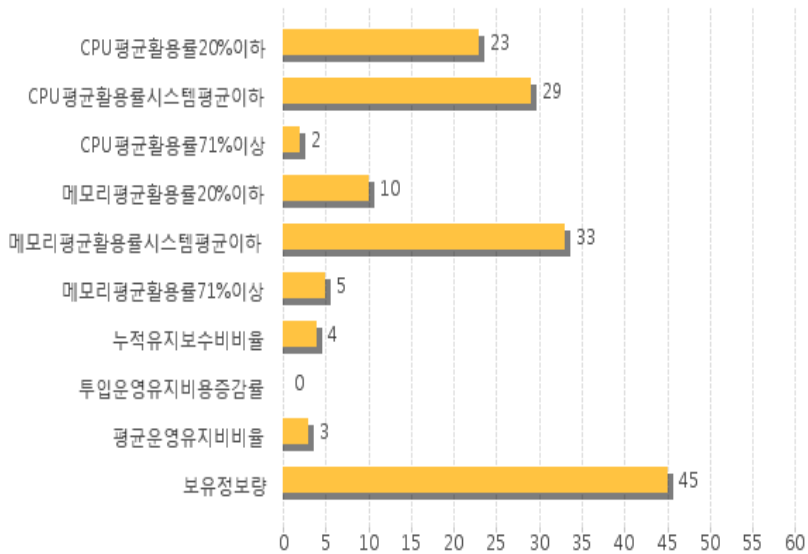
상세현황

시스템진단

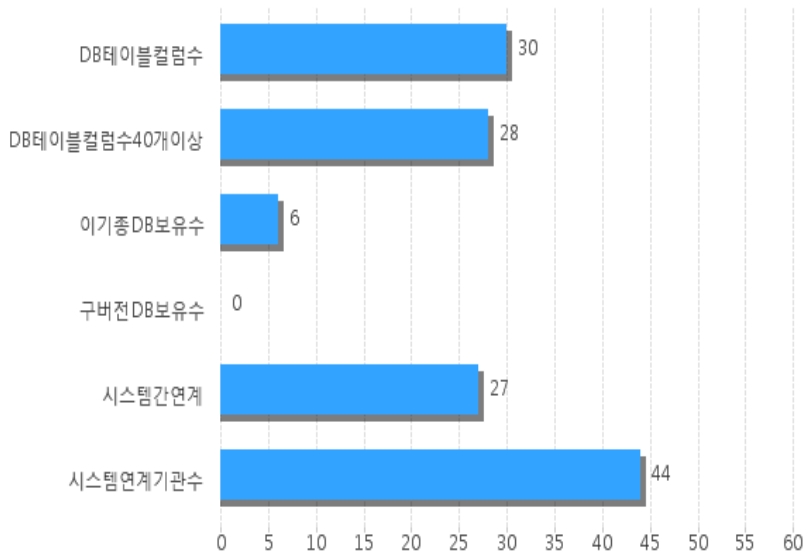
통합데이터탐색

시스템유사중복
가능성탐색

시스템효과성[미흡]



시스템효율성[미흡]



63 개

재난 분야

A 측정지표

비율로 보

기관유형	분야	시스템효과성									
		측정지표	CPU평균활용률 20%이하	CPU평균활용률 시스템평균이하	CPU평균활용률 71%이상	메모리평균활용 률20%이하	메모리평균활용 률시스템평균이...	메모리평균활용 률71%이상	누적유지보수비 비율	투입운영유지비 용증감률	평균운영유지 비비율
광역자치단체			12	14	1	3	11	1	1	0	
기초자치단체			1	2	0	1	5	0	0	0	
중앙행정기관			10	13	1	6	17	4	3	0	

Screenshot (Interactive data analytics)



종합현황

상세현황

시스템진단

통합데이터탐색

시스템유사중복
가능성탐색

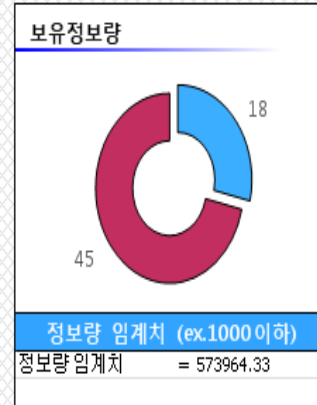
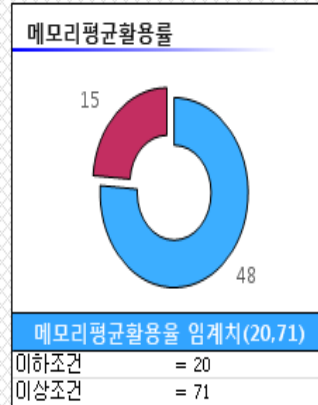
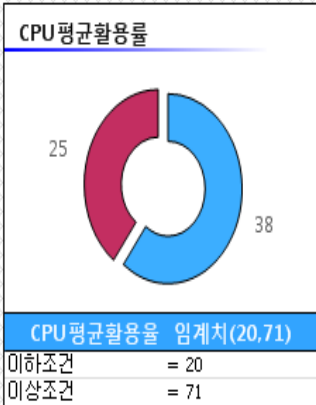
시스템효과성-1

시스템효과성-2

시스템효율성-1

시스템효율성-2

시스템효율성-3



● 양호
● 미흡

시스템효과성 지표 평균값

기관유형	CPU 평균활용률	메모리
광역자치단체	23.24	
기초자치단체	27.25	
중앙행정기관	30.57	

시스템효율성 지표 평균값

기관유형	DB테이블컬럼수	DB종
광역자치단체	11.18	
기초자치단체	7.78	
중앙행정기관	12.29	

시스템간연계



시스템별 : 시스템간연계

울산광역시	국민안전체	경상남도	충청북도
구조구급활동정보시스템	구조구급활동정..	구조구급활동정..	구조구급활동정..
국가산입단..	재난영상정..	재난영상정보(CC..	재난영상정보(CC..
원주시	충청남도	괴산군	경기도
재난영상정보(CCTV)통합연..	재난영상정보(CC..	재난..	재난영상정보(CCTV)통합연..
인천광역시	정부통합전..	남양주시	문경시

측정지표

- 투입운영유지비용
- 누적유지보수비율
- 평균운영유지비율
- DB테이블컬럼수
- DB테이블컬럼수40
- 이각종DB유수

Screenshot (System duplications between agencies)



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[유사시스템]

←
↻
→

종합현황
상세현황
시스템진단
통합데이터탐색

시스템유사중복
가능성탐색
키워드참고

기관

- 기관유형 · 광역자치단체
- 상위기관명 · 울산광역시
- 기관명 · 울산광역시

검색

현행정보시스템명검색

Q 검색

정보시스템목적검색

Q 검색

관련법령검색

Q 검색

주요기능검색

Q 검색

시스템요과성 지표 평균값			
기관명	CPU평균활용률	메모리평균활용률	누적
울산광역시	10.00	25.00	

시스템효율성 지표 평균값			
기관명	DB테이블컬럼수	DB종류수	시스템간단
울산광역시	12.32	1.00	4.00

시스템선택	
기관유형	현행정보시스템명
광역자치단체	119신고서비스확대시스템

현행정보시스템목적

11종 긴급전화콜 119로 통합

현행정보시스템주요기능

신고이첩, 3자통화, 정보관리 등

관련법령

-

유사_시스템선택		
유사_기관유형	유사_현행정보시스템명	유사도
중앙행정기관	중앙119출동지원시스템	0.29

유사_현행정보시스템목적

중앙구조단의 출동대편성과 근무관리, 조직관리하는 중앙119출동지원시스템과 시도재난을 모니터링하는 모니터링시스템으로 구성

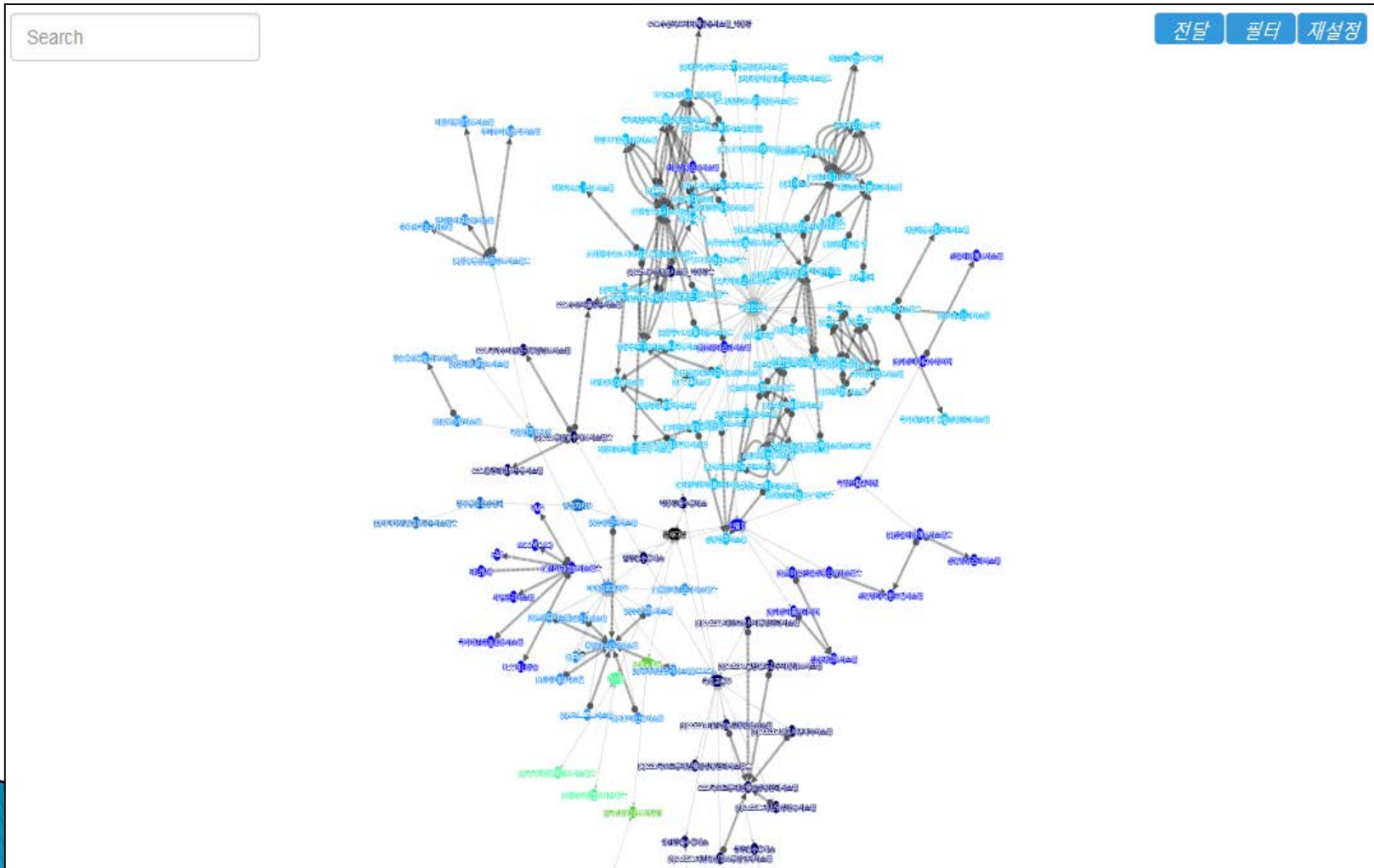
유사_현행정보시스템주요기능

중앙구조단과 시도간의 출동시스템 연계, 시도재난 모니터링, 중구단 근무관리 등

유사_관련법령

소방기본법

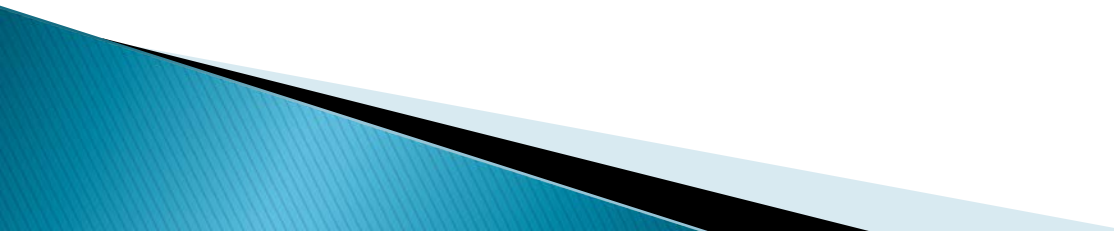
Screenshot (Systems Relationship Diagram)



Screenshot (Word Cloud)



Implications

- ▶ Data quality in Government-wide EA Portal
 - Non-input data, data errors
 - ▶ Need to provide permanent data collection service to visualization system for auditors
 - ▶ Development of additional quantitative indicators
- 

Thank you

danke 謝謝 ngiyabonga
спасибо Баярлалаа faafetai lava
nanni nandri kiitos dankie maururu
bedankt bayarlalaa dhanyavad
enkosi bayarlalaa dhanyavad
hvala maururu
koszonom
dank je misaotra matondo
paldies grazzi
teşekkür ederim mahalo
tapadh leat
xвала
asante manana
obrigada tenki
chokrane murakoze
dijere dieuf tau mochchakkeram
mamnun
sulpáy
go raibh maith agat
dзякую
sukriya kop khun krap taiku
arigatō takk dakujem trugarez
sagolun chnorakaloutioun gratias ago gracies
najis tuke ありがとう tanemirt rahmet grazie
merci
diolch dhanyavadagalu shukriya merce мерси
didi madloba kam sah hamnida rahmat
terima kasih
xiexie
eucharistw
mochchakkeram
merci