Campus Safety and Emergency Command Platform System in Tsinghua

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1. Background of Campus Safety
2. Safe Campus Information System Design
3. Platform for Campus Safety and Resilience
Objectives:

- Systematically review campus risk and identify the key problems
- Establish monitoring and warning system using new technologies, e.g., video/camera, smart phone, face/license plate recognition system
- Connect to the neighborhood and to the city
- Establish campus safety protection system

Tsinghua University is one of three major pilots of national “two schools and one city” education comprehensive reform initiative. Some of campus safety incidents: chemical laboratory fire, building fires due to charge of motorcycle battery, food poison, influenza, threat of exploration, traffic accident, flood, etc.
Background Analysis of Campus Safety

Unsafe behaviors
Unsafe state
Unsafe environment
Natural disasters

Hazard
Vulnerability
Risk

Management

Human vulnerability
Material vulnerability
Vulnerability of operational system
Vulnerability of buildings

Resources
- Training and drills
- Rules and regulations
- Organizational structure and competence
- Equipment equipping
- Unit use and maintenance
- Monitoring system
- Monitoring system

Unsafe state

Equipment equipping
Unit use and maintenance
Monitoring system
There are many visitors and it is difficult to control the persons.

Many experimental equipments are difficult to monitor.

Miscellaneous experimental waste is difficult to handle safely.

Dangerous chemicals are difficult to monitor and control.

Many association activities are difficult to track and manage.

Network public opinion is fierce, and communication control is difficult.

Security awareness is weak, and overall enhancement is difficult.

We need to integrate information resources, establish a unified management platform, and strive to achieve:

There are basic knowledge and plan for everything.
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Strive to achieve the construction target of campus security platform.

Take **the risk** as the main line, take **the stability** as the goal.

**New concepts for security, new modes for management**

- Management systemization
- Grid management
- Data dynamization
- Site transparency

**Strive to achieve**

- Comprehensive management
- Monitoring the full process
- Information all converged
- Full control of the school situations
- Hidden risk all excluded

**Management systemization**

**Grid management**

**Data dynamization**

**Site transparency**
Campus Safety Information Collection and Database

Collect safety related information

Campus safety information collection and database

- Classrooms
- Office building
- Laboratory building
- Dormitory building
- Hazard Resource protection
- Campus facilities
- Laboratory equipment
- Student associations
- Commonwealth organizations
- Campus enterprises
Campus Safety Information Collection and Database

"Information islands" joined together

Administration office

Department of logistics management

Local Street office

Property management company

Housing management service centre

Public security department

Students' affairs office

Information centre

Laboratory and equipment

Canteen service centre
Campus Safety Information Collection and Database

"Information islands" joined together
Campus Safety Information Collection and Database

Information collection

- staff, student, inhabitant, transient personnel, special personnel
- university owned corporation, student association, non-profit organization
- full process information and public opinion information of various security incidents in school

- personnel
- houses
- component
- incident organization
- compon component

- classroom building, dormitory, office building, residential building, stadium, hospital experimental area, radioactive and biohazard zone
- campus facility, laboratory equipment, lifeline, hazard, protection object
Campus Safety Information Collection and Database

Campus security comprehensive protection platform

Full control of the school situation

Fire extinguishing system
- fire extinguishing mainframe
- fire extinguishing water supply monitoring system

Information monitor and reporting system
- IoT monitor
- crowds collect image and report
- voice call
- public opinion monitor
- related organization information system

security system
- Video monitoring
- grid patrol
- door access system
System Userage

**School Leadership**
- Intuitive understanding of campus operation
- Quickly respond campus emergency decision

**Student and Staff**
- Enhanced public security awareness
- Easy access to security information
- Public safety knowledge training
- Conveniently report security information

**Safety Grid Manager**
- Routine patrol
- Monitoring warning
- Emergency response coordination
- Resource management
System Framework

Campus BIM, GIS modeling

Dynamic risk information collection
- Identification of risk assessment index
- Classification of monitoring elements
- Sensors installation and deployment
- Information collection and access

Campus risk prevention, control and emergency coordination platform

Risk identification and analysis
- Identification of campus security risk incident
- Complete risk index system construction

Multi-source information access technique
- Classification of monitoring information
- Multi-source heterogeneous information integration and access

Information integration and analysis technique
- Combination of IoT and GIS/BI
- Cross impact chain analysis
- Real-time risk assessment and visualization

Emergency coordination
- Situation comprehend
- Emergency coordination and command
- Resource management and scheduling
**Scenario Development**

**Targeting**
- Initial objectives
- Latent objectives
- Target revising

**Planning**
- Risk/opportunity analyzing
- Objective setting
- Lessons learning

**Scenario/Exercise**
- Fit/gap analyzing
- Exercise testing
- Lessons learning

**Internal/external assessment**
- Planning
- Data collecting/analyzing
- Lessons learning
- Recommendations

**Implementation**
- Person preparation
- Material preparation
- Monetary preparation
- Implementation

New Mission
Contents

1. Background of Campus Safety
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Digital preplan management system

- Operational safety accidents
- Public health accidents
- Social security accidents
- Natural disasters
- Traffic accidents
- Fire accidents

Plan drill call
Plan automatically recommended
Analytical statistics management
Preplan centralized management
Digital plan compile
Daily Supervision

- Daily inspection
- Instant sign in
- Information collection
- Information reporting
- Incident report
- Mobile video
Daily Supervision and Early Warning

School teachers & students photo upload

50km/h Leave On-campus speed monitoring

On-campus speed monitoring License plate recognition

Campus Security Comprehensive Protection Platform

**road manhole cover lost** Photo upload Report Repair

License plate recognition
Important Event Management and Early Warning
Emergency Management

Comprehensive management

- Information reception & report
- Related plan
- Information statistics
- Monitoring, early warning and emergency coordination platform
- Implement campus emergency response
- One-click calling
- Video conference
- One-click SMS, fax
- Digital plan
- Information collection
- Resource scheduling
- Emergency coordination
Emergency Management

All stakeholders involved in emergency prevention and closed-loop information

- Emergency information
- Emergency disposal scheme
- On-site command
- Rescue
- Equipment monitoring
- Personnel monitoring
- Event information (Location, Disaster, Measures Taken)
- Live feedback (audio, video, pictures)
- Monitoring information (event progress)

Platform system
- Command
- Rescue
- Protection
- Level confirmation
- Accident type confirmation
- Preplan automatic extraction
- Remote power off, open access control system
- Early warning information release (large screen mobile broadcast, etc.)
- Verify the information, inform the emergency response team
- One-touch calling, text messaging, fax
- Relevant leaders and responsible persons

Emergency information
- Telephone conference
- Video consultation
- Cellphone, PAD, Telephone, Fax

Relevant leaders and responsible persons
Grasp the first three opinion analysis; play three force roles; maintain social harmony and stability

First time

First definition

First attitude

Hard power

Soft power

Smart power
Public Safety Education and Training

Provide comprehensive, multi-level, and three-dimensional security training for different types of users and different types of security incidents on campus to improve campus security awareness as a whole.

**Interaction**
- WeChat, Microblog, APP
- Social Classroom Activities
- Open science practice

**Teaching**
- Personal Safety Education
- Public Safety Education
- Fire Safety Education
- Disaster Safety Education
- Traffic Safety Education
- Cyber Security Education

**Consultation**
- Risk Hidden Consultation
- Fire Knowledge Consultation
- Emergency Drill Consultation.
Campus Safety Information Client

Cellphone APP

Leadership exclusive page

Info portal

Public version

信息门户

teaching

科研

财务

新闻

Information retrieval

Information collection

gridman

leadership

version

leadership

exclusive

page

campus

safety

information

client

public

version

Cellphone APP

Leadership exclusive page

Info portal

Teachers & students upload photo

log in

log in

用户名: Tsinghua

密码: ******

Public version

Cellphone APP

Leadership exclusive page

Info portal

Information retrieval

Information collection

gridman

leadership

version

leadership

exclusive

page

campus

safety

information

client

public

version

Campus Safety Information Client

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Info portal

Public version
Thank you !