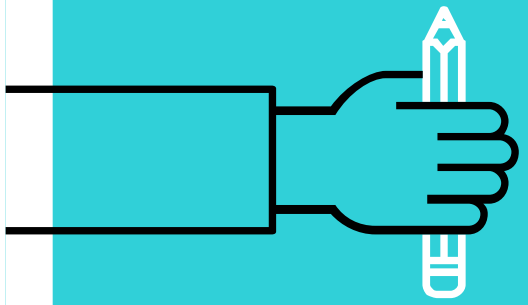
NOVA SCHOOL OF SCIENCE & TECHNOLOGY

Technological Risks and Opportunities in the use of LTE and 5G private networks by public agencies in smart city scenarios

8th Doctoral Conference on Technology Assessment
2021.04.19



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Professor Miguel de Castro Neto
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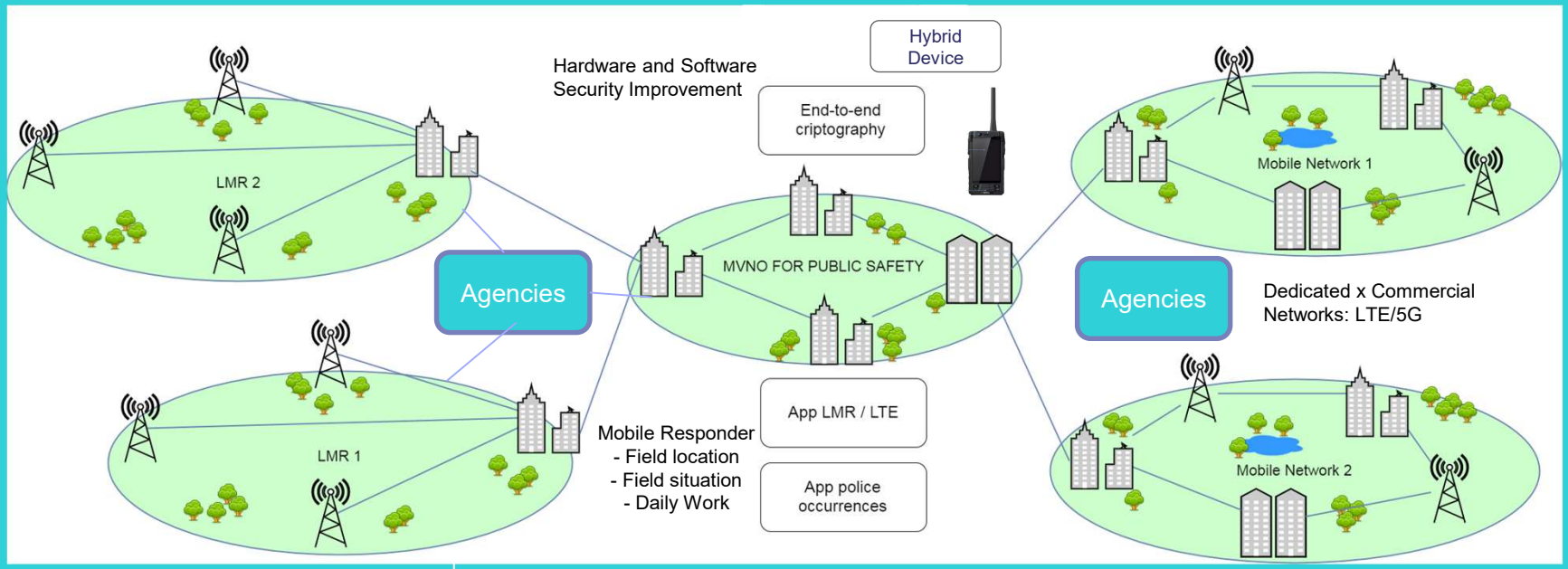
Possible Scenarios: Needs for TA



Open Sources information:
- Social networks
- Forums
- Blogosphere
- WEB / WWW
- pictures / Photos
- Audio / Video…

Data Base information:
- Cameras
- Police
- Traffic
- Energy…

Analyze large amounts of data and extract information

On-scene handling
- Real time recognition through comparison between targeted data bases and videos / images from cameras (faces and vehicles).
- Audio recognizing from the collection of sounds as guns shooting.

Problem to Solve

Government needs to use mobile broadband service to increase efficiency of public safety services

Narrow band networks (P25, Tetra and Tetrapol) and inefficient investments in multiple networks need to be replaced by a convergent and unique new mobile broadband infrastructure dedicated to public safety.

Commercial networks are not fit for purposes due to the lack of security and availability for critical mission applications.

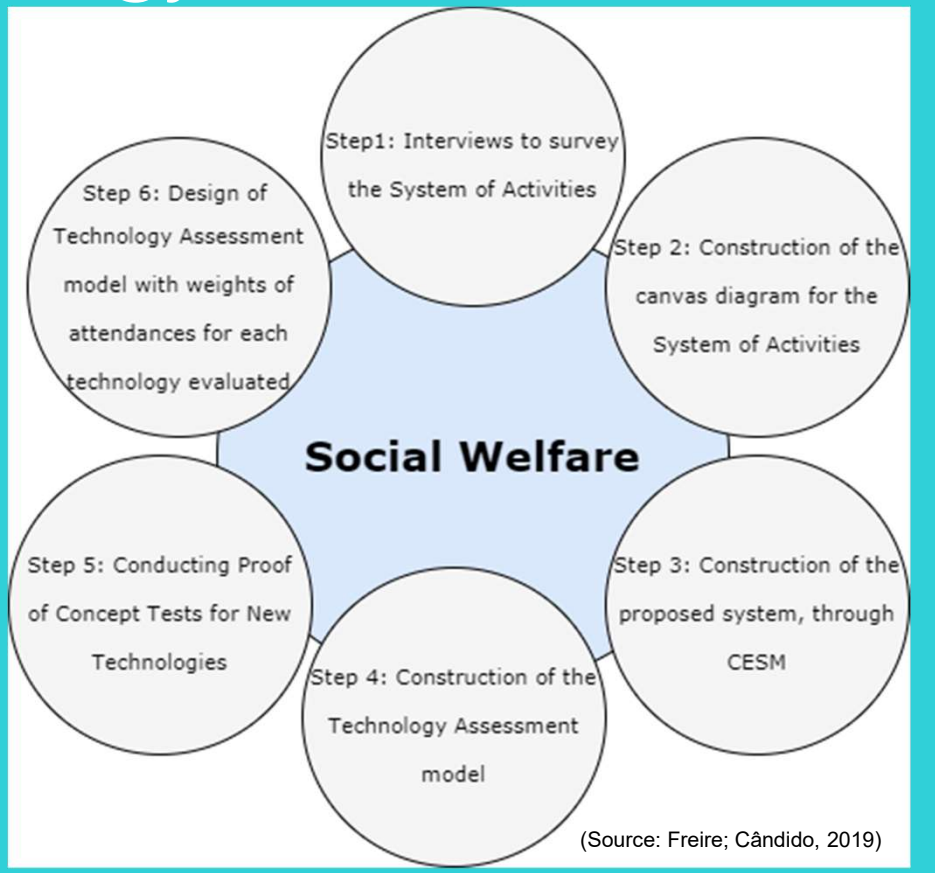
Deployment of a new and dedicated mobile network is costly and takes long time.

in Brazil, U$ 600 million dollars, in more than 30 different critical communication networks.

Six Step Model Methodology

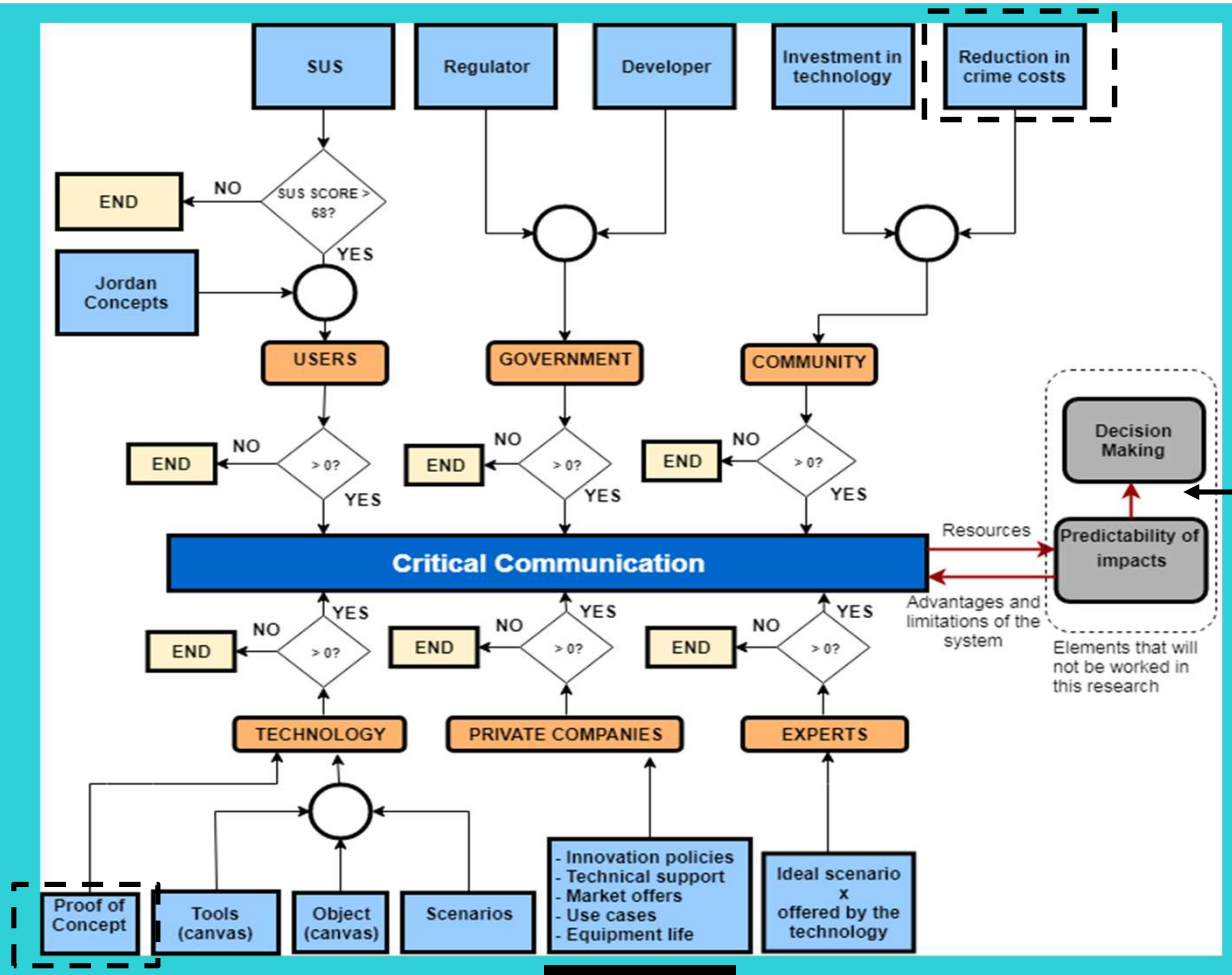
Methodology developed in the master thesis: Proposal for Technology Assessment Methodology for Critical Communications: practical application as a support for decision making process.

Broaden the discussion to Public Agencies in Smart Cities Scenario.



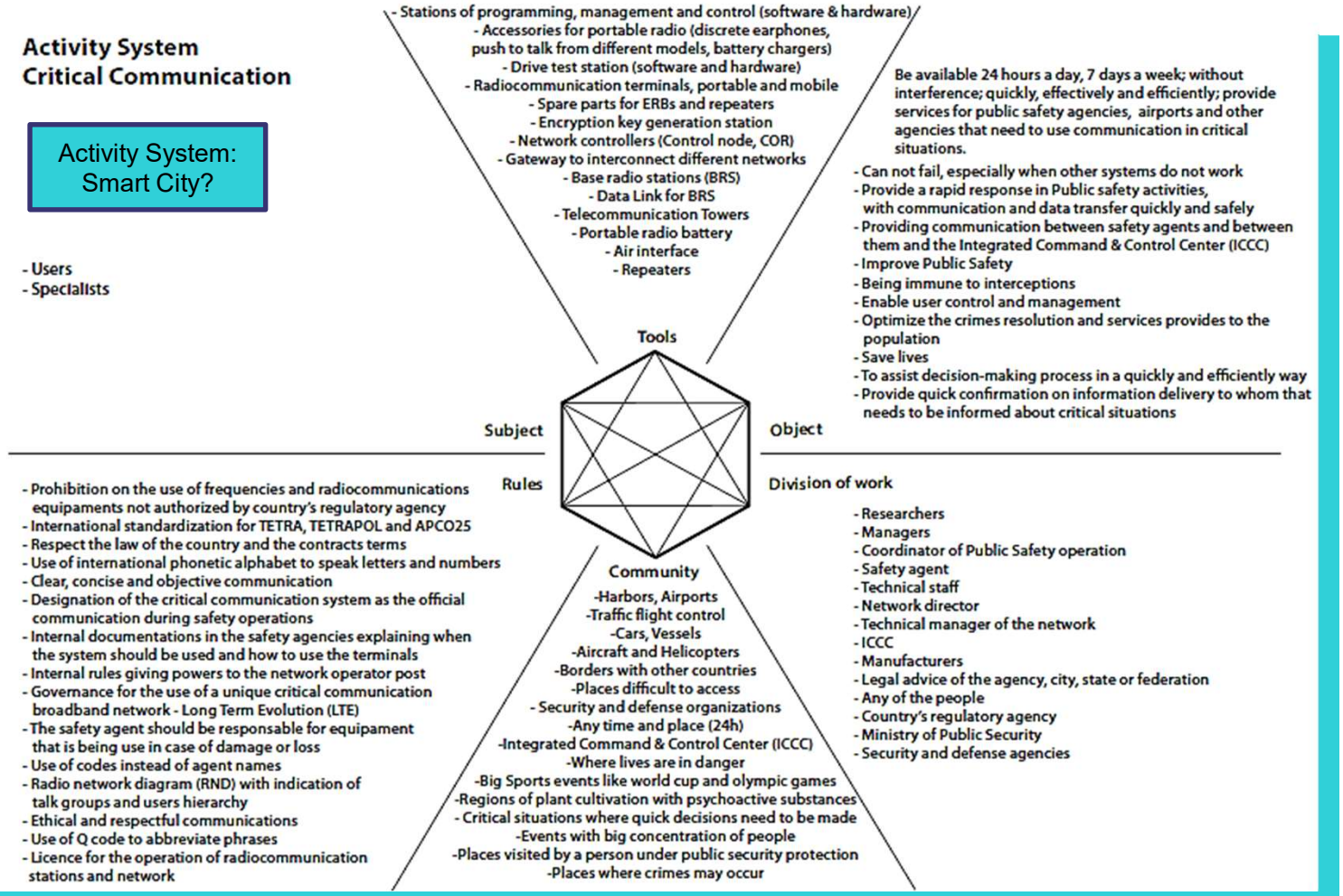
(Source: Freire; Cândido, 2019)

Step 4


SUS
Regulator
Developer
Investment in technology
Reduction in crime costs
END
NO
SUS SCORE > 68?
YES
Jordan Concepts
USERS
GOVERNMENT
COMMUNITY
END
NO
> 0?
YES
Critical Communication
Resources
Advantages and limitations of the system
Decision Making
Predictability of impacts
Elements that will not be worked in this research
Smart City Scenario
TECHNOLOGY
PRIVATE COMPANIES
EXPERTS
Proof of Concept
Tools (canvas)
Object (canvas)
Scenarios
- Innovation policies
- Technical support
- Market offers
- Use cases
- Equipment life
Ideal scenario x offered by the technology

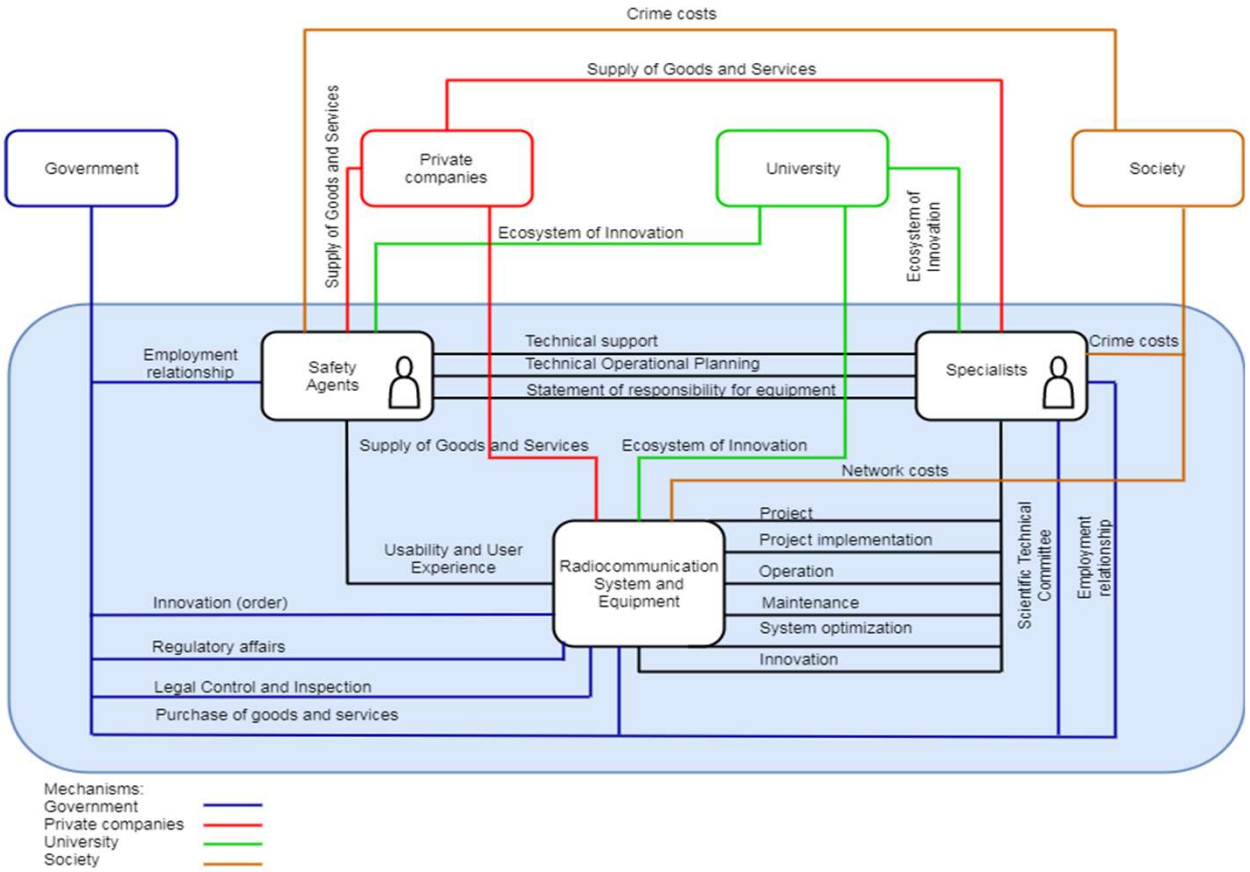
Step 2

Public agencies using communication networks in smart cities scenarios



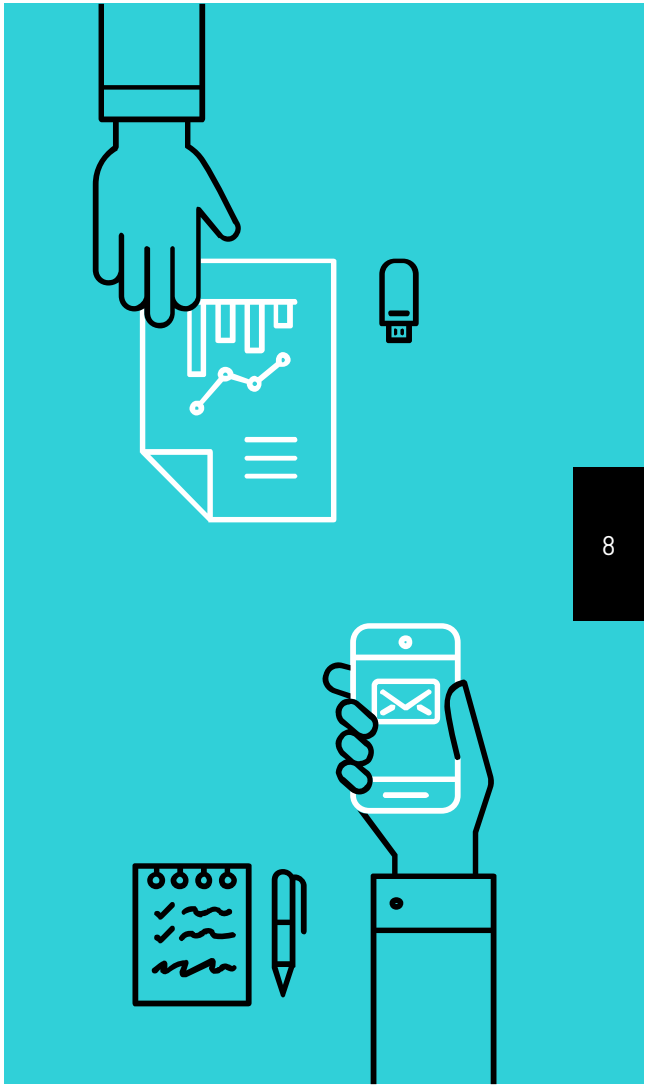
Step 3 – Ecosystem innovation and key metrics

Smart City Scenario?



THESIS PROJECT

Goals	Research Techniques and Methods
Study risks and opportunities for public agencies to use resources in an integrated and intelligent platform available at smartphones and hybrid radios (LMR / LTE / 5G).	Modelling the situation: Systematic Literature Review, Bibliographic review; Data collection through interviews with users and specialists (User Experience; Activity Theory; Task Analysis; systemism). Steps 1; 2; 3 and 4
Support the discussion on how the ethical issue can be integrated into the analysis (Data Protection Analysis, regulations, laws and ethical issues).	Systematic Literature Review, Bibliographic review; Data collection through interviews with specialists; Focus Group
Studies predictability methods to estimate how the benefit of public agencies using efficient and integrated communications systems in a smart city context.	Systematic Literature Review, Bibliographic review; Delphi
Analysis of LTE and 5G networks for Critical Communications use case	Systematic Literature Review, Bibliographic review; Data collection through interviews with specialists; step 5
Results Presentation in a system view	step 6



Validation of The Methodology

Master Thesis

FREIRE, D.V.C. **Proposal for Technology Assessment Methodology for Critical Communications: practical application as a support for decision making process.** Master Thesis in Information Science at Federal University of de Santa Catarina, Brazil (2019). 10.13140/RG.2.2.16296.93442.

Books

FREIRE, D.V.C.; JORGE, J. M. R. ; CANDIDO, A. C. **Avaliação tecnológica para comunicações críticas: contexto social.** In: Adilson Luiz Pinto. (Org.). Aproximação entre a Ciência da Informação com a Ciência Policial. 1ed.Florianópolis: SENAC, 2019, v. 1, p. 105-133.

Conferences

FREIRE, D.V.C.; CANDIDO, A. C. . **Avaliação Tecnológica Em Comunicações Críticas: Análise Para Decisão.** In: XIX ENCONTRO NACIONAL DE PESQUISA EM CIÊNCIA DA INFORMAÇÃO, ENANCIB 2018, 2018, Londrina. XIX ENCONTRO NACIONAL DE PESQUISA EM CIÊNCIA DA INFORMAÇÃO, ENANCIB 2018, GT-8 Informação e Tecnologia. Londrina: Universidade Estadual de Londrina, 2018. p. 5388-5396.

FREIRE, D.V.C.; CANDIDO, A. C. . **Avaliação das Tecnologias Empregadas no Brasil para Sistemas de Radiocomunicação Digital: Análise Para Decisão em um Órgão Público Federal**. In: II Consórcio Mestral e Doutoral da Rede de Gestão da Informação e do Conhecimento, 2018, Curitiba. II Consórcio Mestral e Doutoral da Rede de Gestão da Informação e do Conhecimento. Curitiba: Universidade Federal do Paraná, 2018.

FREIRE, D.V.C.; MELLO, A. C. B. ; CANDIDO, A. C. . **Eliciting User Requirements For Critical Communications In Public Safety Using Activity Theory And Systemism.** In: 13th International Conference on Interfaces and Human Computer Interaction (IHCI 2019), 2019, Porto, Portugal. Proceedings of the Internacional Conferences of Interfaces and Human Computer Interaction 2019, Game and Entertainment Technologies 2019 and Computer Graphics, Visualization, Computer Vision and Image Processing 2019. Porto, Portugal: IADIS Press, 2019. p. 435-438

FREIRE, D.V.C.; CANDIDO, A. C. ***Framework* Para Criação de Ambientes de Inovação em Órgãos de Segurança Pública no Brasil.** Congresso latino- iberoamericano de gestão tecnológica ALTEC, Medellin, Colombia. 2019.

FREIRE, D.V.C.; CANDIDO, A. C. **Technology Assessment as Support in the Decision-Making Process for Modernizing Critical Communication Technologies Used by Public Safety Agencies in Brazil.** 4th European Technology Assessment Conference, Bratislava, Eslováquia. 2019.

Papers

FREIRE, D.V.C; CANDIDO, A. C. **O Aspecto Informacional no Levantamento de Cenários para Comunicações Críticas em Segurança Pública no Brasil.** Revista Conhecimento em Ação, Rio de Janeiro, v. 5, n. 2, Jul/Dez. 2020. P. 76-97. ISSN: 2525-7935. https://doi.org/10.47681/rca.v5i2.34167.

Any questions?

Thank you!

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