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**Practical approach to enhance the functionality of
infrastructure systems in case of natural disasters**

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Outline

- **Importance of function of infrastructure systems**
- **Characterisation**
- **Pragmatic methodology to strengthen infrastructure systems in disasters**

Importance of function of infrastructure systems

- **Disaster response**
 - Management (Fire / Police)
 - Transportation system
 - Telecommunication
 - Health

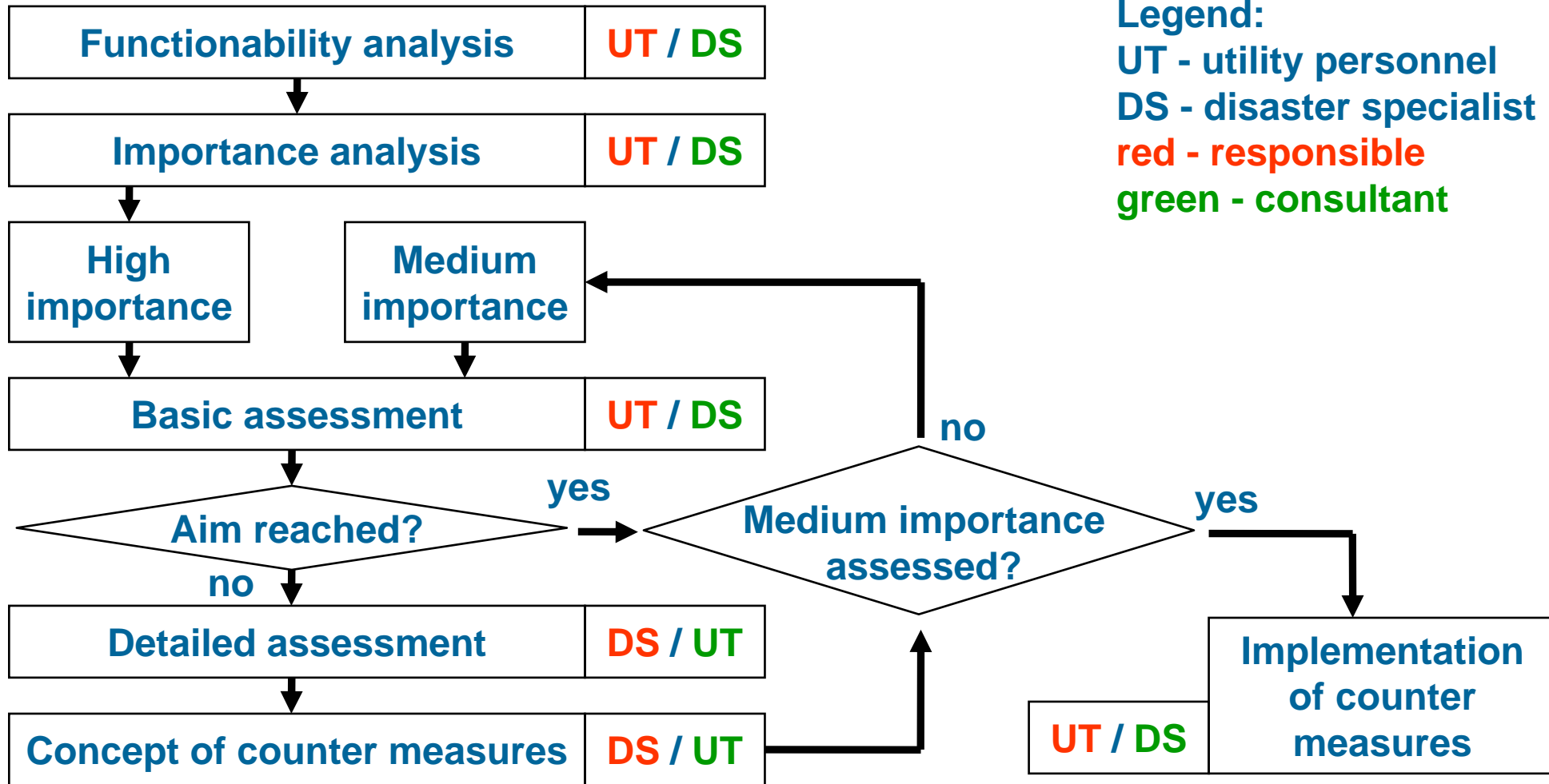
- **Emergency assistance**
 - Transport
 - Health

- **Reconstruction**
 - Transport
 - Energy
 - Telecommunication

Characteristics of infrastructure systems

		linear elements	structural points
Energy distribution system	<ul style="list-style-type: none"> • electricity • water • gas • heat • petrol 	<ul style="list-style-type: none"> • back bone • grid 	<ul style="list-style-type: none"> • control points • "Transformers"
Transportation (terrestrial)	<ul style="list-style-type: none"> • rail • road 	<ul style="list-style-type: none"> • network - main - local 	<ul style="list-style-type: none"> • stations • control points
Transportation (non terrestrial)	<ul style="list-style-type: none"> • water • air 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • posts • storage etc.
Health	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • transportation 	<ul style="list-style-type: none"> • hospitals
Telecommunication	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Fixed • back bone • local distribution • Mobile • back bone 	<ul style="list-style-type: none"> • switch stations • control system • antenna / control stations

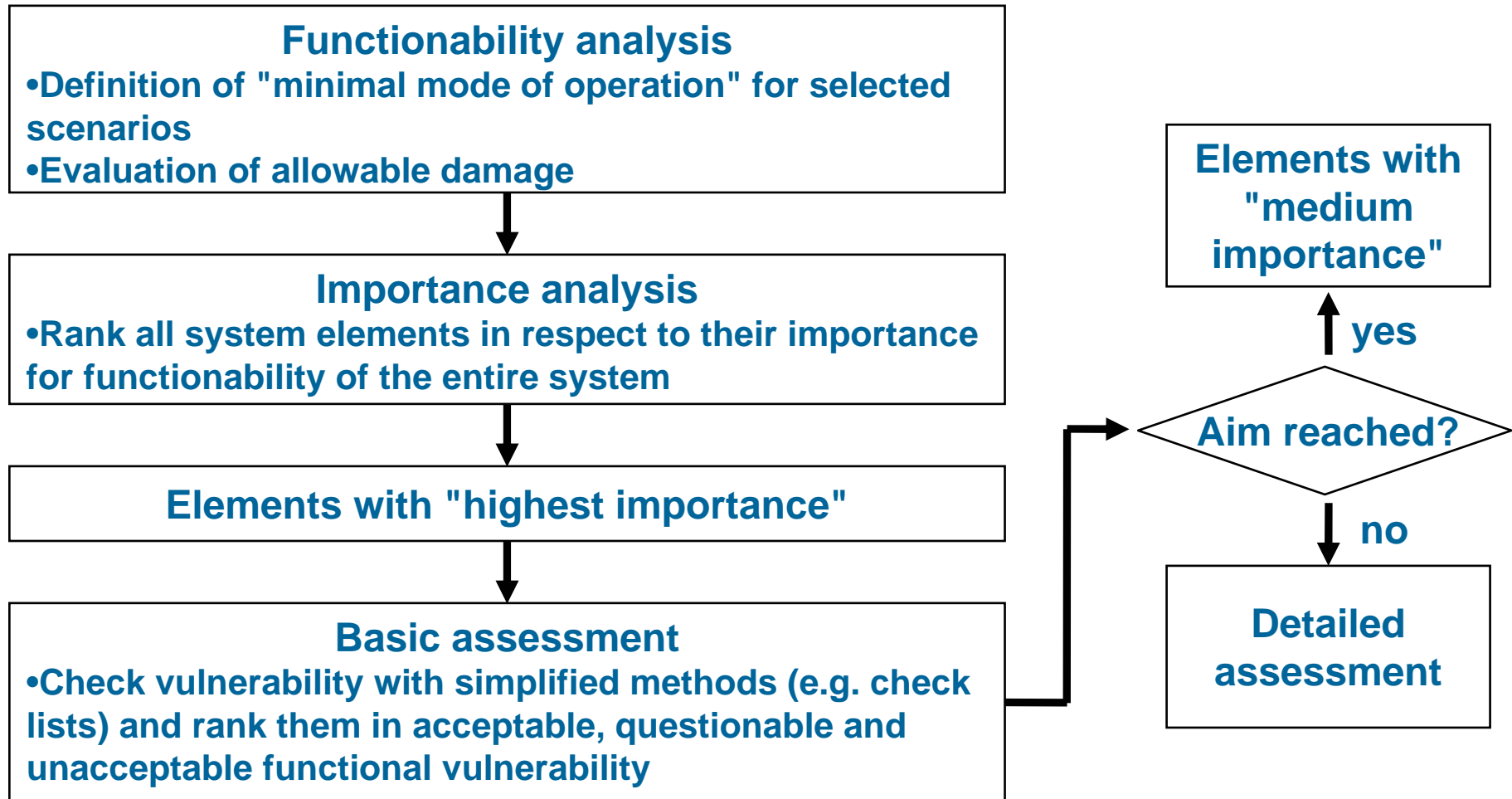
Procedure of evaluation



Advantage of methodology

- **Takes experience of utility personnel and disaster specialist into account**
- **Strong involvement of utility personnel**
 - ensures that system characteristics are really taken into account
 - enhances the chances that results are implemented

Procedure of evaluation - initial basic assessment



Procedure of evaluation - detailed assessment

