



Pharma Supply Chain Risk Management

Presentation at 1st Ghana Infrastructure Conference
Accra, 6th - 8th Aug 2018

Sascha Düerkop

Fulda University of Applied Sciences, Department of Business



Agenda

- Research Environment
 - About us / HS Fulda / HOLM Frankfurt / Research Consortium
 - PSCRM as a lighthouse project
- Pharma Supply Chain Risk Management
 - Relevance and research gap
 - Vision
 - The risk management process
- Next steps



About us

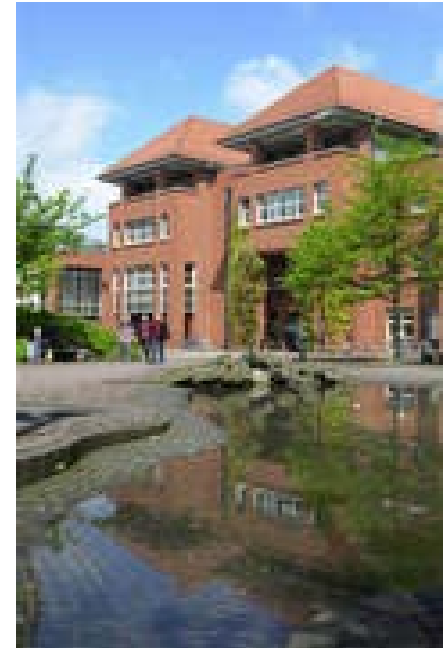
- **Prof. Dr. Michael Huth**
 - 1990-2000: Diploma, PhD and PostGrad in Business Admin in Frankfurt and Southampton
 - 2000-2003: Worked as a self-employed Risk Management Consultant
 - Since 2006 Professor for logistics and SCM at Fulda University
 - 6 months as a visiting professor in Australia and USA
- **Sascha Düerkop**
 - 2007-2012: B.Sc. and M.Sc. in mathematics in Aachen
 - 2012-2013: Studied Business Admin in Aachen
 - 2014-2018: Research Associate in Operations Research in Cologne, Siegen, Wuppertal
 - Since 2013: Founder and Board Member of a global sports development organization
 - Since 2016: Research Associate for risk management in logistics at Fulda University





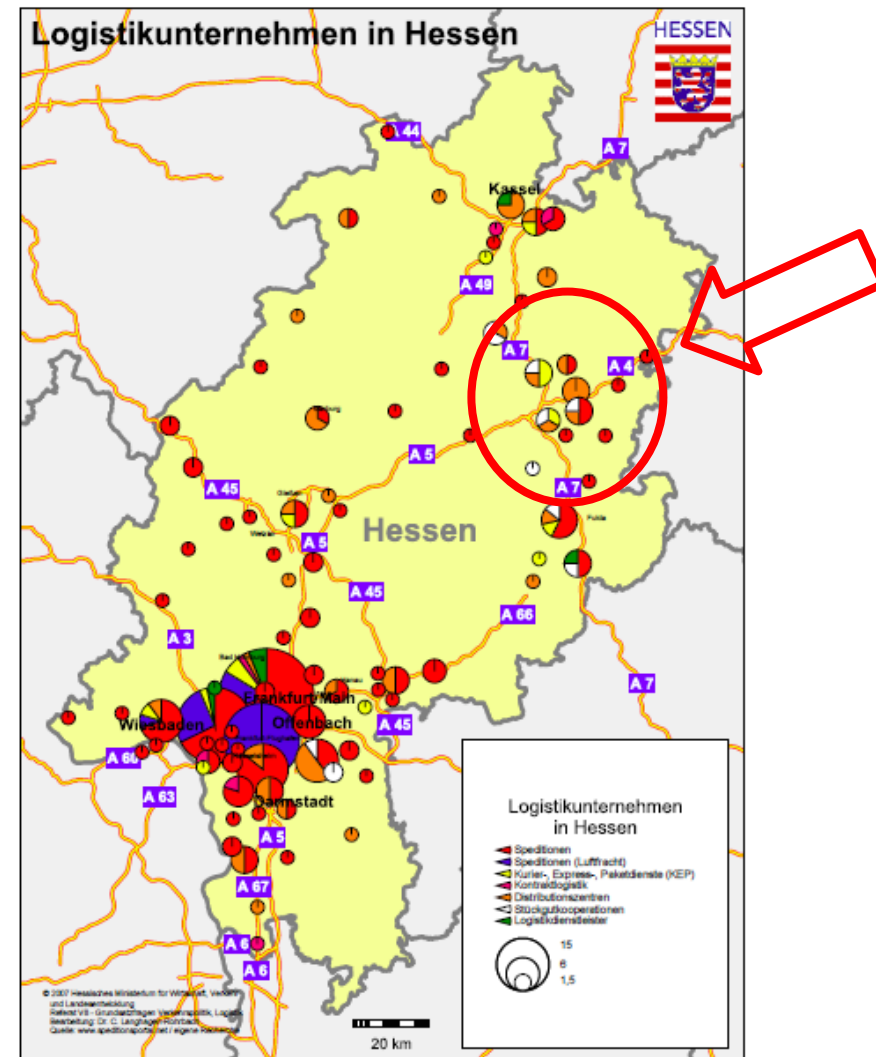
University and Department

- Fulda University of Applied Sciences was founded in **1974**.
- More than **9,000 students** are enrolled in 8 departments.
- The **department of business** is – with more than 1,500 students – the largest department at Fulda Uni.





Who we are...





Who we are...

University and Department

- Since 2014, our center for logistics and supply chain management has a branch at the

‘House of Logistics and Mobility’ (HOLM).





The idea for
Gateway Gardens





HOLM today...





Seminar room



Lots of green outside



A location for networking



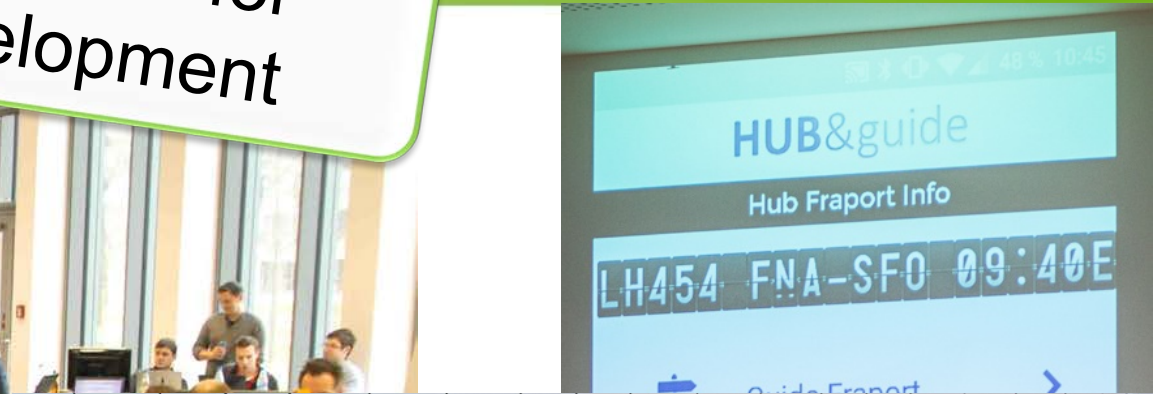
A location for learning



HACKATHON@HOLM 4.-6. MÄRZ 2016

A location for
development

Hochschule Fulda
University of Applied Sciences





Research Environment

Developer

Research Consortium

Associated



Funding



Exzellente Forschung für
Hessens Zukunft





PSCRM as a lighthouse project

- Proves the efficiency of a common research center
- Links industry leaders, public grant-givers and research excellence
 - Corporate know-how (and data) are used to conduct research that suits the needs of the industry
 - Interdisciplinary researchers of various institutions, focusing all on logistics, collaborate to tackle such a massive task together
 - Public grant-givers are made aware of the project through the PR of HOLM



Relevance and Research Gap

- The three key problems in pharma logistics are:
 - Assuring product integrity through the entire SC
 - Guarantee safety of patients
 - Working within the regulatory frameworks (EU GDP, FDA, etc)
- How are those tackled so far?
 - Corporate and individual (SC manager) experience!
 - Certifying every sub- (and sub-sub-) contractor
 - In-house risk management (rare)
- Where is the gap?
 - The industry needs a standardized, integrated and preventive supply chain risk management system that
 - Supports the user in designing a supply network
 - Informs the user transparently about existing risks
 - Supports the user in choosing the right logistics partner for the right region



Vision – Launching „MYTIGATE“ software

- MYTIGATE will provide pharmaceutical producer, wholesaler, forwarder and carrier with a **list of supply chain partners** and their capabilities along a specific lane. Based on this, the shipper will be able to **select specific routes and service providers**.



The risk management process - I

- In a first step, potential routings are determed
 - Aim: Based on flight route data, cargo vessel routes, train networks, etc.
 - Current status: Collaboration with “Rome2Rio”
 - Problem: Tailored for passengers, not cargo
 - Prioritizes flights, doesn’t consider long-haul sea routes

FROM Holiday Inn Accra Airport, G... X



TO Fulda University of Applied Sc... X



GH ACC <air> DE FRA <rail> DE FUL

← Fly to Frankfurt, train 283€ - 839€

11 h 31 min

includes 42 min transfer

● Holiday Inn Accra Airport

● Walk for 15 min
● Approx 1,3 km

● Accra (ACC)

● 9 h 5 min by Plane
250€ - 800€

● Frankfurt (FRA)

↔ Change stations

● Frankfurt(M) Flughafen Fernbf

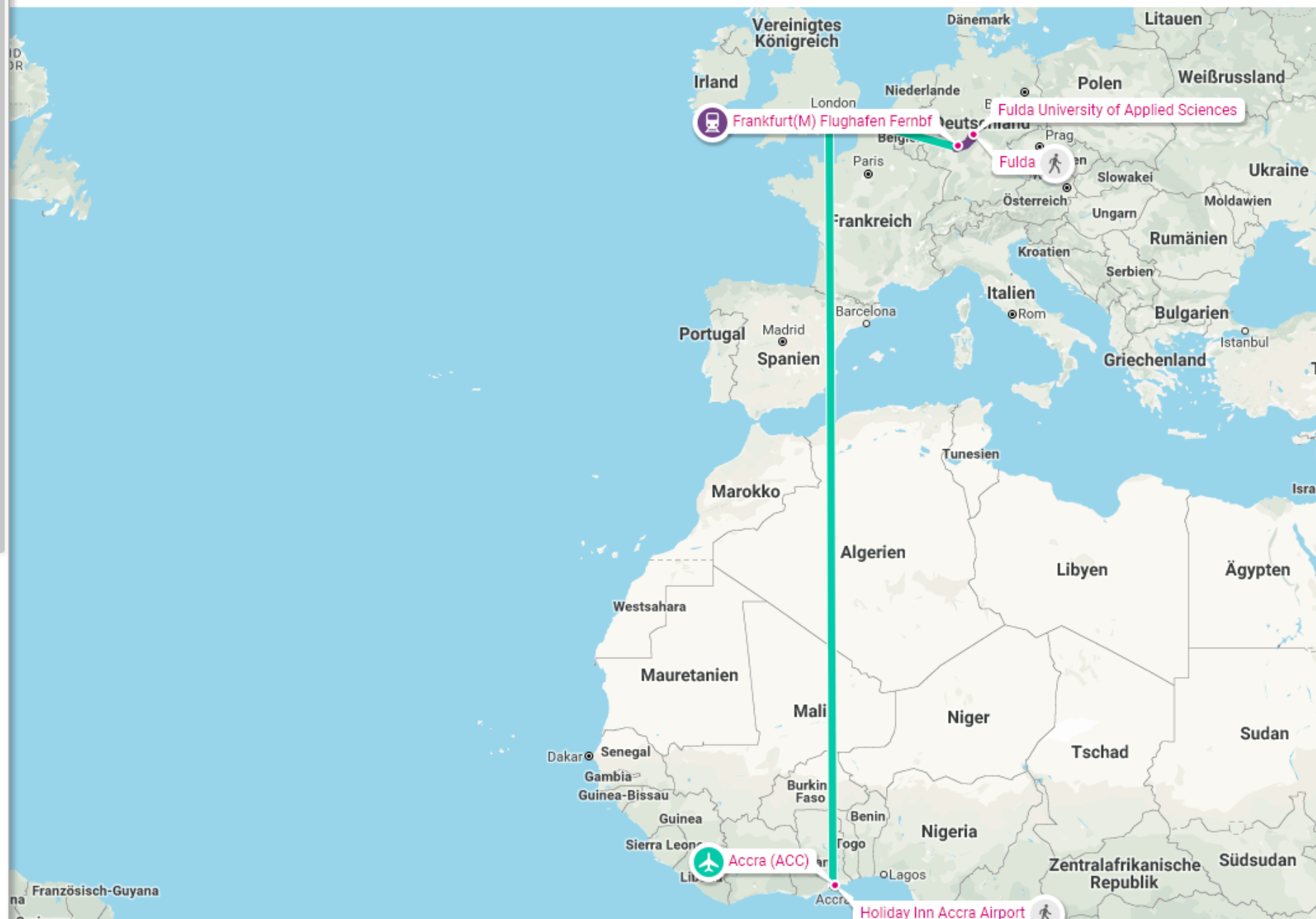
● 1 h 11 min by Train, hourly
ICE
25€ - 40€

● Fulda

● Walk for 18 min
● Approx 1,5 km

● Fulda University of Applied Sciences

46 Accommodations



FROM Holiday Inn Accra Airport, G... x

TO Fulda University of Applied Sc... x



GH ACC <air> TR IST <air> DE CGN
<rail> DE SIG <rail> DE FRA <rail>
DE FUL

Fly



Fly



Fly



Fly



Fly



Fly



Ads



U



tra



Accra (ACC)

10 h 40 min by Plane

290€ - 800€

Cologne/Bonn Apt (CGN)

Change stations

Köln, Girengel/Flughafen Köln/Bonn
Flughafen Bf

16 min by Train, hourly

S19 ICE

10€ - 15€

Siegburg Bf

Change stations

Siegburg/Bonn

40 min by Train, hourly

ICE ICE International

30€ - 45€

Frankfurt(M) Flughafen Fernbf

1 h 11 min by Train, hourly

ICE

25€ - 40€

Fulda



FROM Kumasi, Ghana



TO Fulda University of Applied Sciences



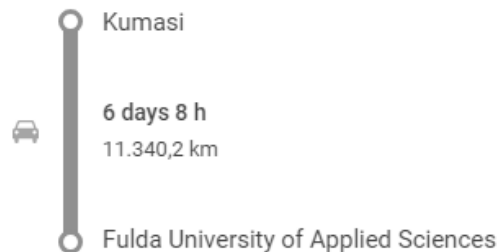
GH ACC <road> GH KUM ... <road>
NE NIM ... <road> TR IST ... <road>
DE FUL

← Kumasi to Fulda University of Applied Sciences

Drive from Kumasi to Fulda University of Applied

🚗 6 days 8 h ⓘ Approximate fuel cost: 1200€ - 1900€ 11.340,2 km

Drive Details



Get driving directions ↗

Need to rent a car?

Compare rental car prices >

🏠 Fulda Accommodation

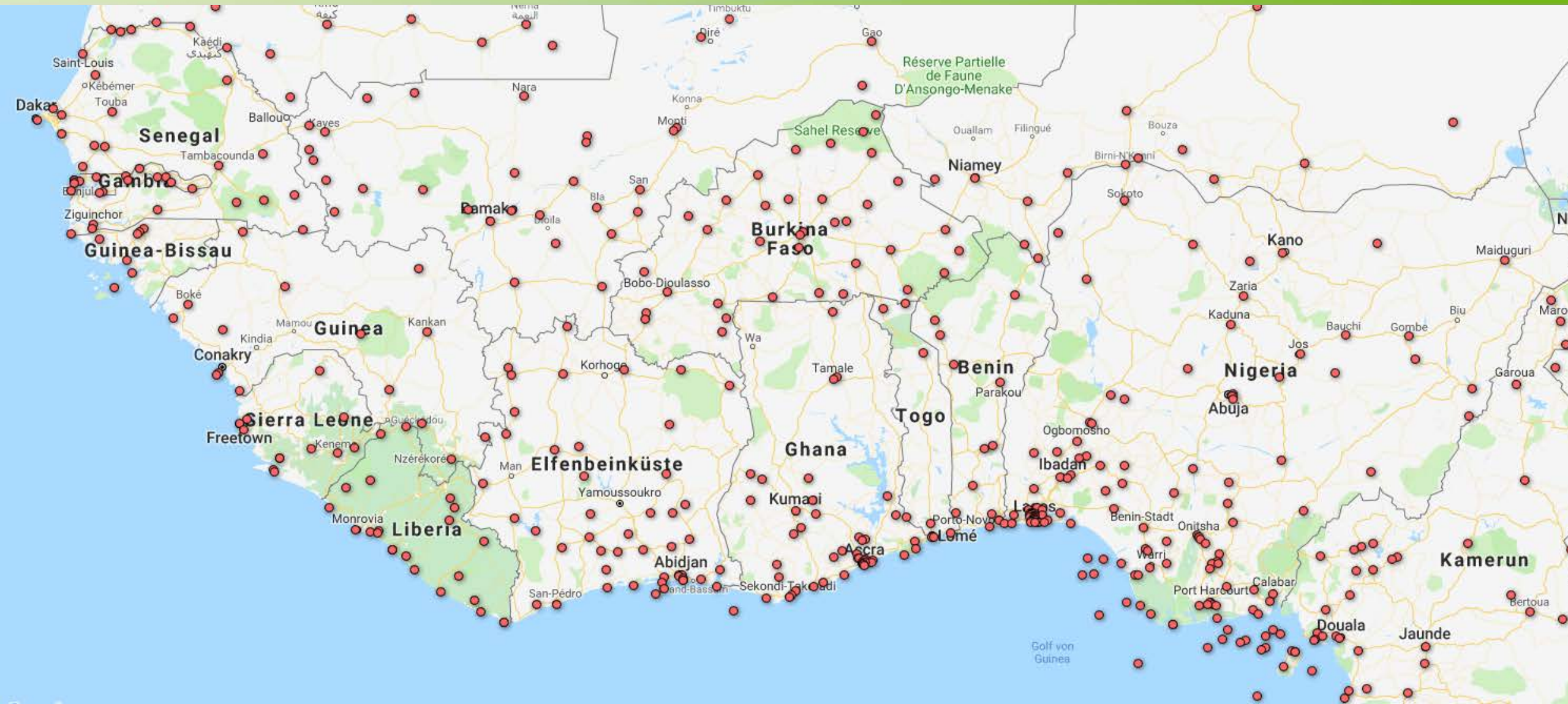
There are over 46 available hotels in Fulda

Rooms from: 40€ >





Pharma Supply Chain Risk Management





The risk management process - II

- Based on the actual transport specifications, all logistical operations within the SC are identified and mapped on the geo-locations.
 - The set of logistical operations is based on a SCOR model of pharma logistical chains
- Additionally, all concerned parties (contract logistic service providers) for the specific route are determined
 - Based on specific routings of various airlines, cargo shippers, etc.



Pharma Supply Chain Risk Management

55975	GHANA							GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89
55976	Abeka	ABK	AA	--3----	0536N 00014V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55977	Abor	ABO	TV	--3----	0603N 00052E	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55978	Accra	ACC		---45---		GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55979	Achimota	ACH		-----6--	0537N 00014V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55980	Ada	ADA		1-----		GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55981	Ahinsan	ANN	AH	-----6--	0620N 00131W	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55982	Akosombo	ASB	EP	--3----	0618N 00030E	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55983	Amasaman	AMA		-----6--	0542N 00018V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55984	Asamankese	ASA		--3----	0552N 00040V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55985	Ashaiman	ASH	AA	-----6--	0542N 00020V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55986	Aura	AUR		1-----		GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55987	Axim	AXI		1-----		GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55988	Benin	BEN	CP	--3----	0536N 00100V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55989	Berekum	BKM		--3----	0727N 00234V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55990	Bogoso	BOG	WP	--3----	0534N 00201V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55991	Bolgatanga	BTG	UE	-----6--	1047N 00051W	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55992	Buipe	NPU	NP	--3----	0847N 00132V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55993	Cape Coast	CCT		1-----		GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55994	Ejura	EJU		--3----	0722N 00122V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55995	Gumani	GUM	NP	-----6--	0927N 00046V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55996	Ho	HOV	TV	--3----	0636N 00028E	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55997	Jubilee FPSO	JUB		-----7--	0437N 00255V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55998	Jumapo	JUM	EP	-----6--	0609N 00018V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
55999	Kasoa	KSA	CP	--3----	0531N 00028V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
56000	Katamanso	KTM	AA	-----6--	0544N 00050V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
56001	Keta	KIT		1-----		GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
56002	Koforidua	KOF		-23-----	0605N 00015V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
56003	Kokomlemle	KKL	AA	-----6--	0534N 00013V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
56004	Konongo	KGO		--3----	0637N 00112V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
56005	Kotoka	KTP		-----5---		GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
56006	Kpandu	KPA		--3----	0700N 00017E	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
56007	Kpetoe	KPE		--3----	0633N 00041E	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
56008	Kumasi	KMS		---4----		GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
56009	Kumasi	KAI	AH	--3----	0641N 00137W	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
56010	Kumawu	KMU		--3----	0654N 00116W	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
56011	Lawra	LAW	UW	--3----	1039N 00252V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
56012	Legon	LEG		--3----	0539N 00012V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
56013	Madina	MAD	AA	--3----	0541N 00010W	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
56014	Mim	MIM	BA	-----6--	0654N 00234V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
56015	Nsaw am	NSA		-23-----	0548N 00021V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
56016	Obuasi	OBU		-23-----	0612N 00140W	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		
56017	Oda	ODA		--3----	0555N 00059V	GHS	en-GH,ak,ee,tw	40	129,8	59,8	108	490	89		



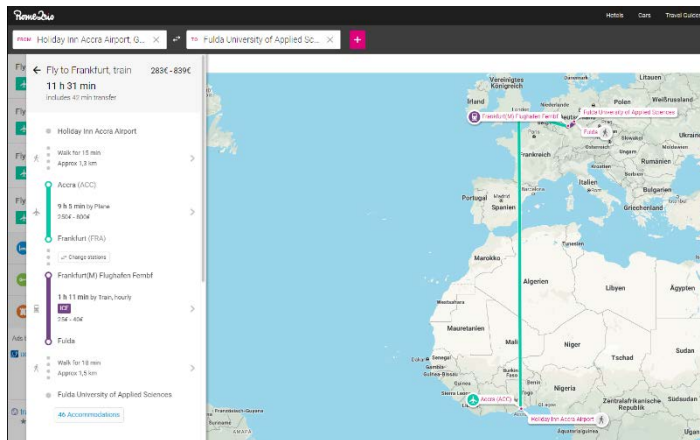
The risk management process - III

- Geographical and Contractor risks are evaluated and quantified:
 - Geographical:
 - Cargo theft rates, frequency of climate catastrophies, time and costs of enforcing contracts, etc.
 - Linguistic, diplomatic, currency, common market “borders” crossed ?
 - Contractor:
 - Is the logistic service provide certified (EU GDP, FDA, national)
 - How is the contractor rated?



The risk management process - IV

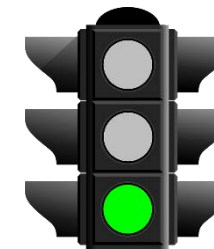
- Finally, the user gets a rating for various routes and contractors and can choose:



+



=



Risk Score:
7%

Risk of loss: 1%
Risk of damage: 2%
Risk of overheating: 12%
...
Risk of delay: 27%



Further research

- How can data be validated and improved?
- Potential collaboration with qualification institutions to accept risk scores to qualify new (market entering) transportation companies
- Integration into data logger software
 - Learning software platform



Contact Data

Sascha Düerkop
Fulda University of Applied Sciences
Department of Business
Leipziger Str. 123
36037 Fulda
Germany

Sascha.Dueerkop@w.hs-fulda.de
+49 / 171 / 537-2764

