



27th annual **INCOSE**
international symposium

Adelaide, Australia
July 15 - 20, 2017



Application to Water Service Project in Kassala, Sudan

Systematic Capacity-Based Risk Assessment



WASHINGTON STATE
UNIVERSITY



Home

Program and Course
Information

Program Delivery

Admission and Tuition

Registration, Schedules
and Required Textbooks

Important Dates

Resources and FAQ's

Make it in Washington
Scholarship Program

News and Announcements

Faculty and Staff

Contact ETM

Jobs

New and Upcoming
Courses

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ETM director spearheads new smart city project.
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Washington State University's Engineering and Technology Management (ETM) program prepares engineering and business professionals to make strategic and operational decisions and become leaders in the management of technology. Courses provide practicing engineers with the knowledge, tools, and skills to manage projects, operations, organizations, and people. The ETM program is specifically tailored for professionals who want to advance their careers while still working full time. Live, online lectures are available from anywhere and at anytime.



News and
Announcements

<https://etm.wsu.edu>

Mohammed Babiker
President, Wayira



Luna Magpili, PhD
Associate Professor, WSU

Cesar Pinto, PhD
Associate Professor, ODU

Gnana Bharathy
ASG Group



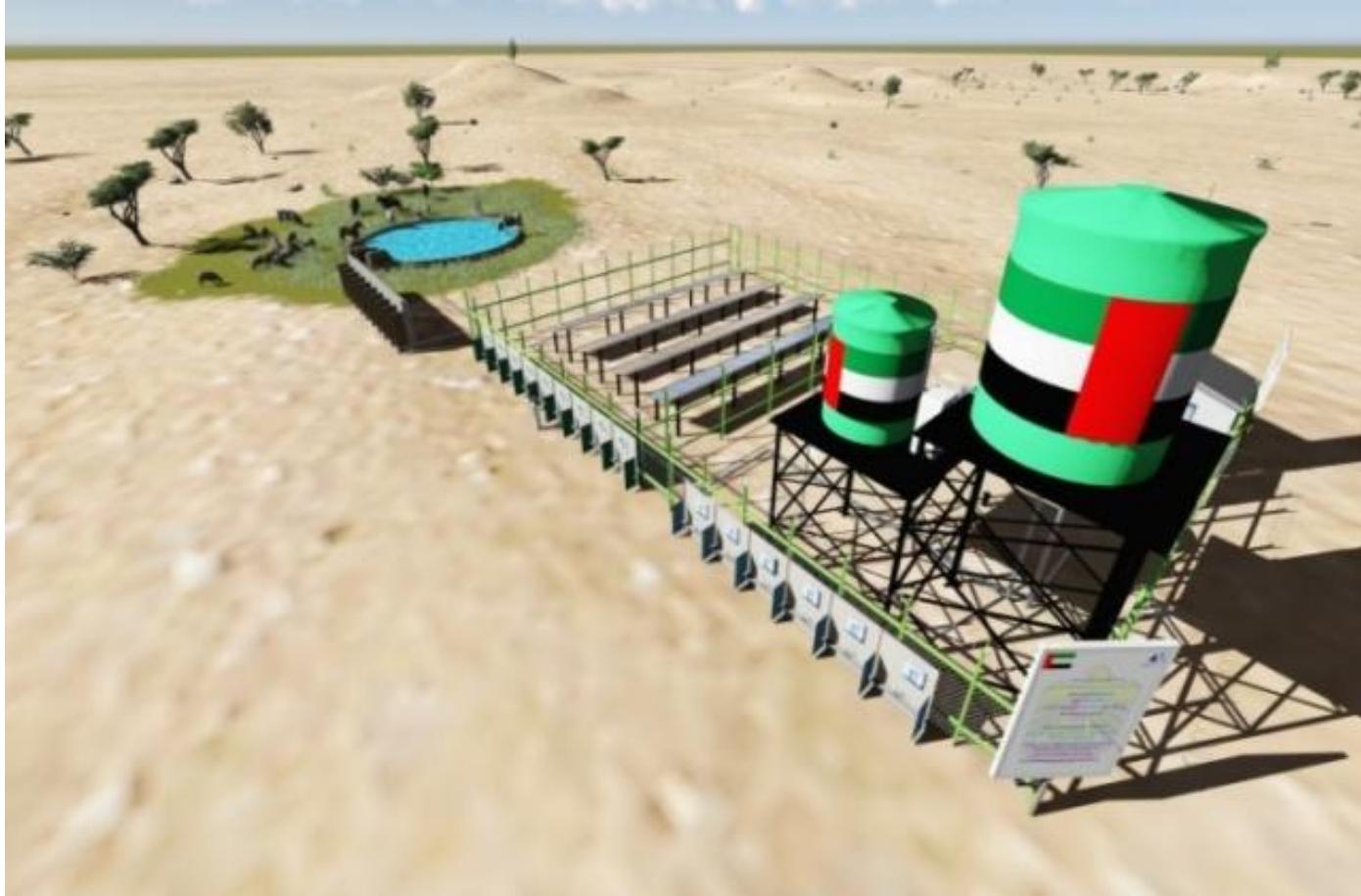
A boy collecting contaminated water, Sudan.
Courtesy of thewaterproject.org



Young woman scooping water from a hole dug in Darfur, Sudan.
Courtesy of Dabangasudan.org



Water Shortage affecting people in Darfur, Sudan.
Courtesy of Sudanreeves.org



Green Wayira solar powered station 3D View

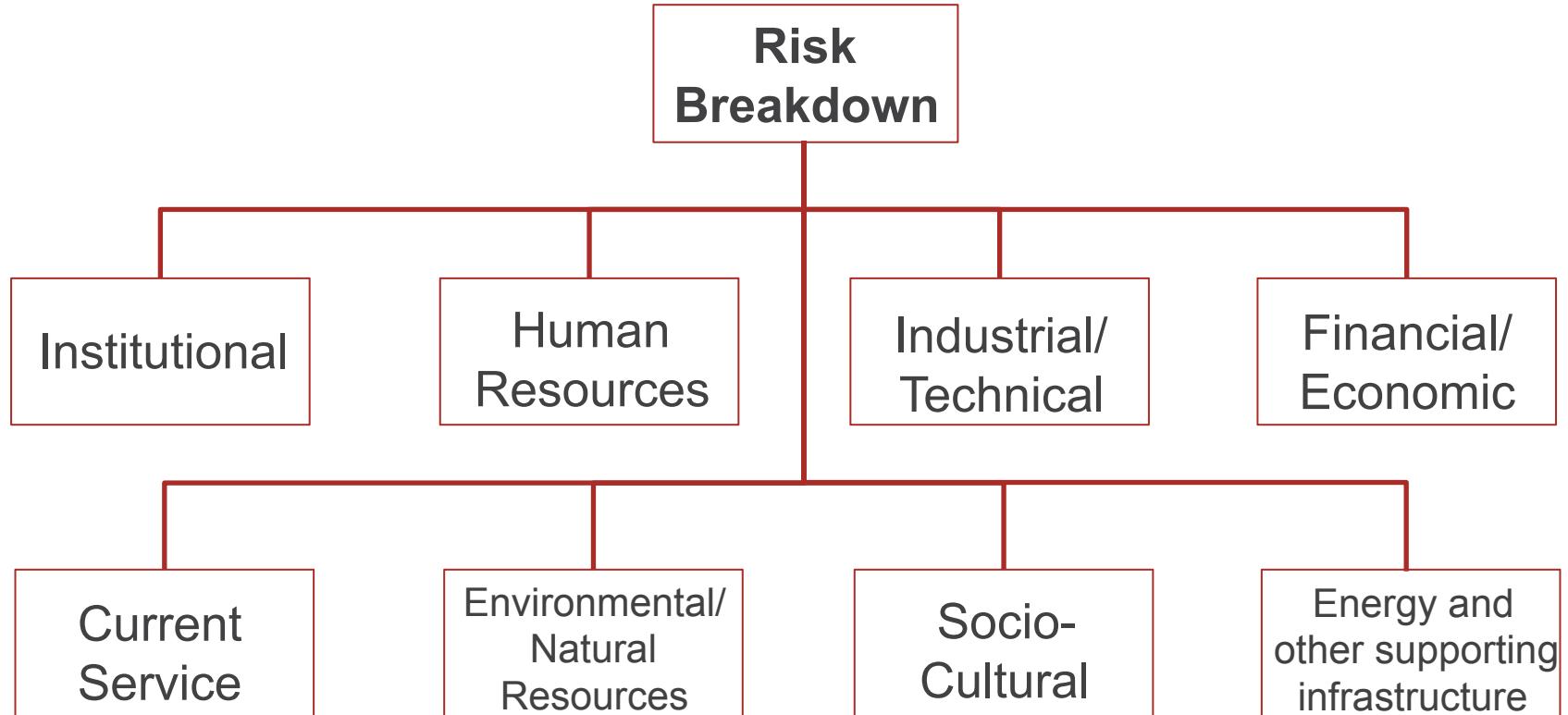
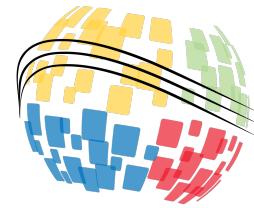
https://youtu.be/ZMZpobOH_EA



- What is the political situation of the country and how can it affect your project?
- What are the prevalent economic factors and its impact on your project?
- How much importance does culture and local ways have in the your project and its implementation?
- What technological innovations are available and how would it work in the context of your local community?
- Are there any current legislations that regulate the industry or can there be any change in the legislations for the industry?
- What are the environmental concerns for the industry?

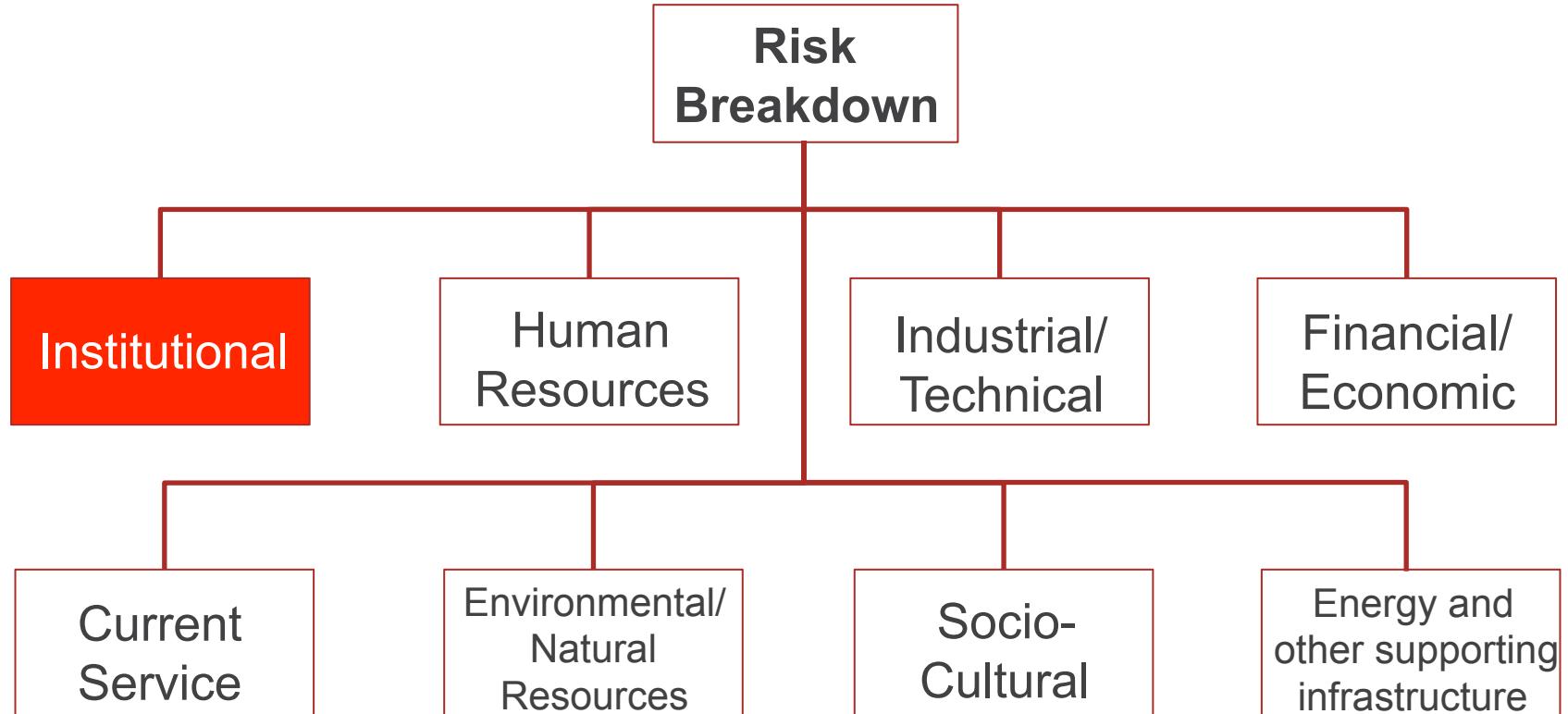
Risk Breakdown Structure

Level1



Risk Breakdown Structure

Level1

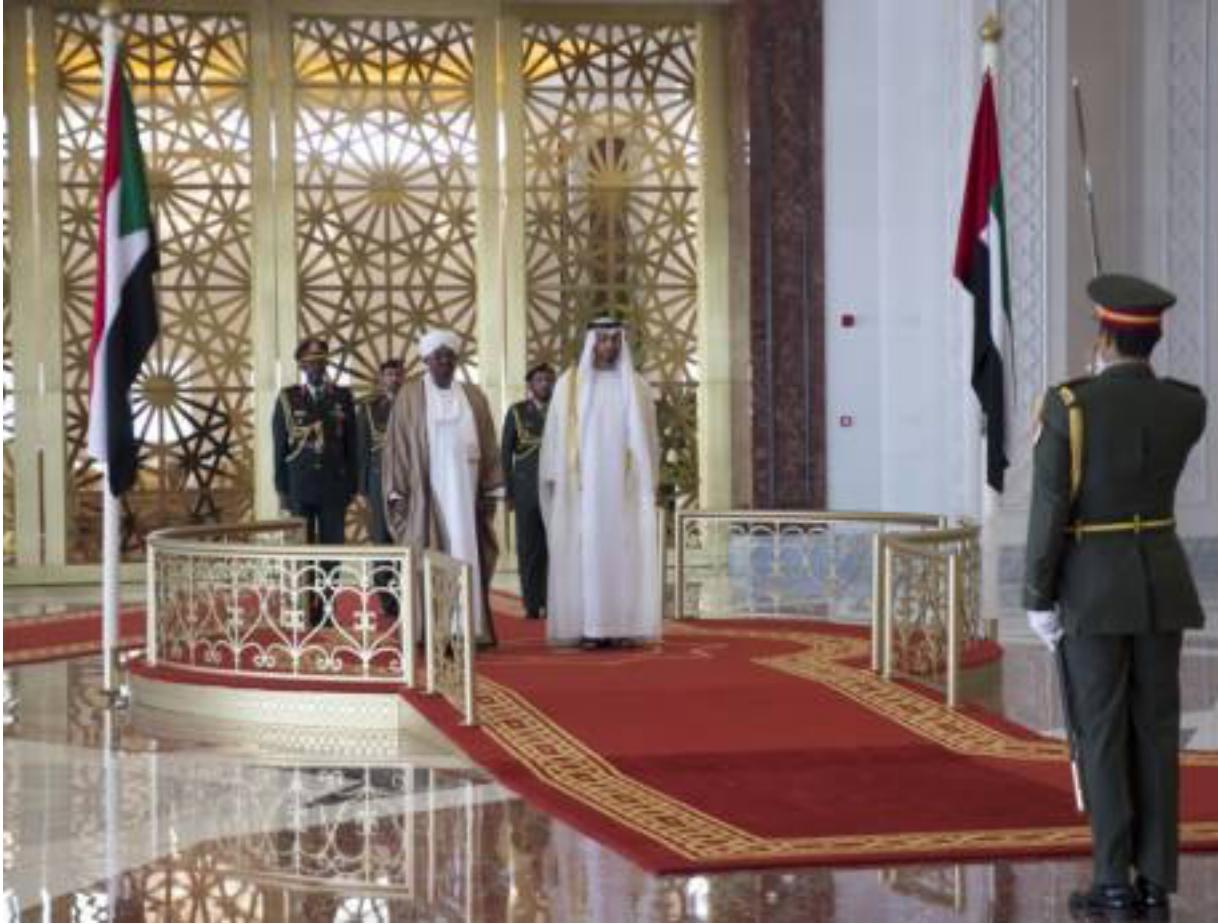
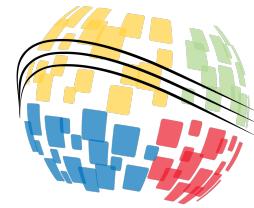


Institutional



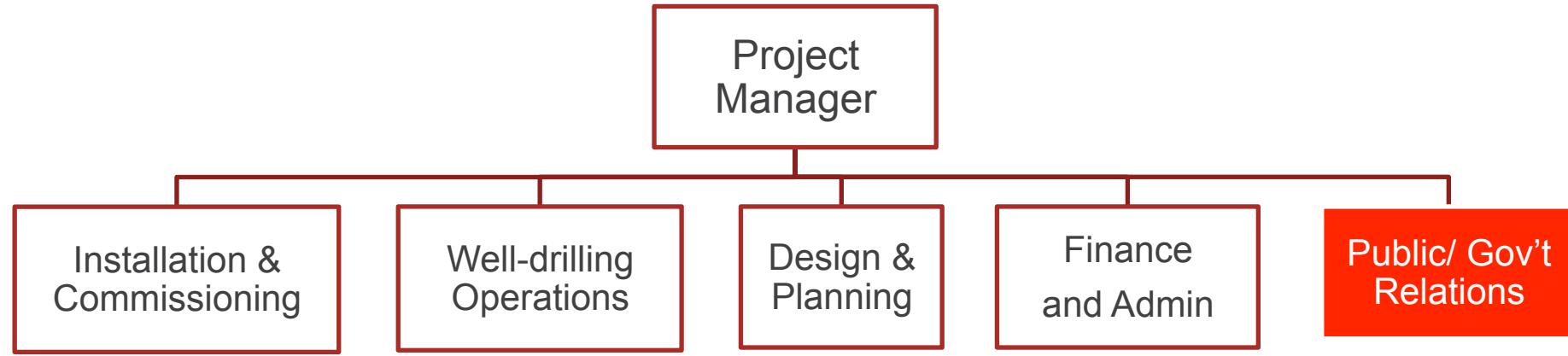
- Institutional enablers refer to the institutional context for legislation, laws, regulation, administration and management of the service.
 - Highly political decision-making
 - Lack or informal laws, regulations and steps involved in a government related processes in Sudan.

Institutional



Shaikh Mohammad Bin Zayed Al Nahyan
and Sudanese President Omar Hassan Al Bashir

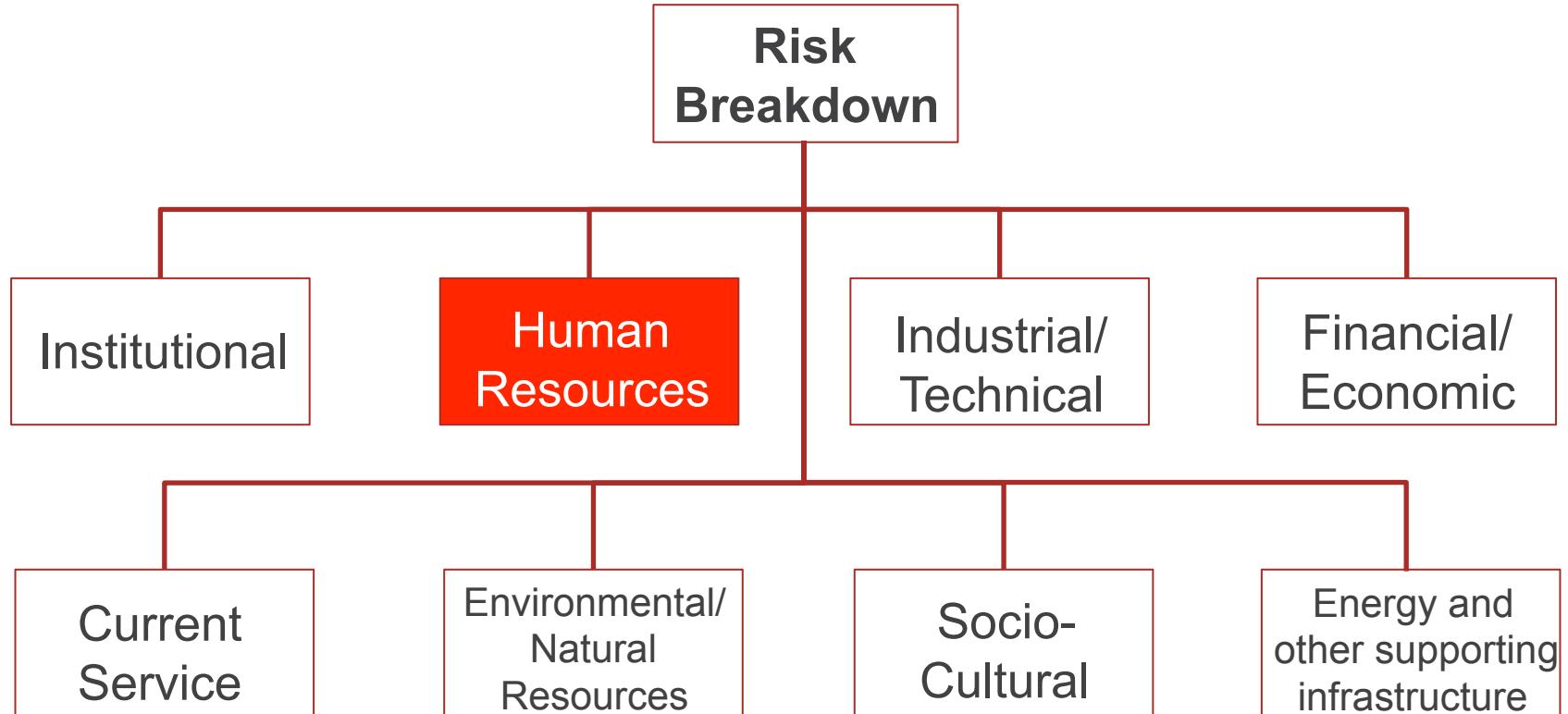
Institutional



Organizational Structure

Risk Breakdown Structure

Level1



Human Resources



- Human Resources enablers refer to the available human resources, including professional, skilled, and unskilled labor.
 - It is very difficult to hire ready skilled employees.
 - It is hard to train unskilled employees;

Human Resources



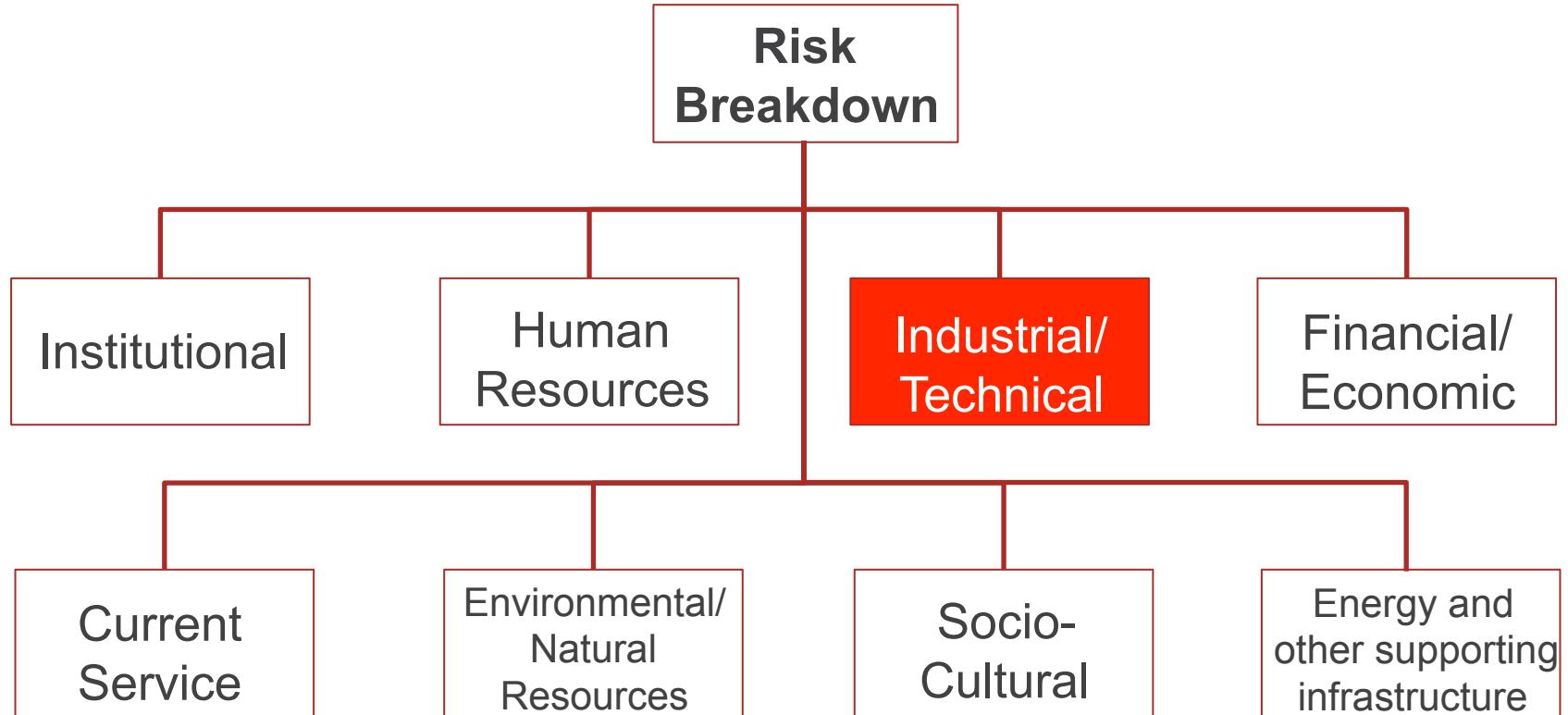
- Competitive Packages
- Education and Training
- Benefits/ Profit-sharing



Green Wayira Staff
Courtesy of Green Wayira

Risk Breakdown Structure

Level1

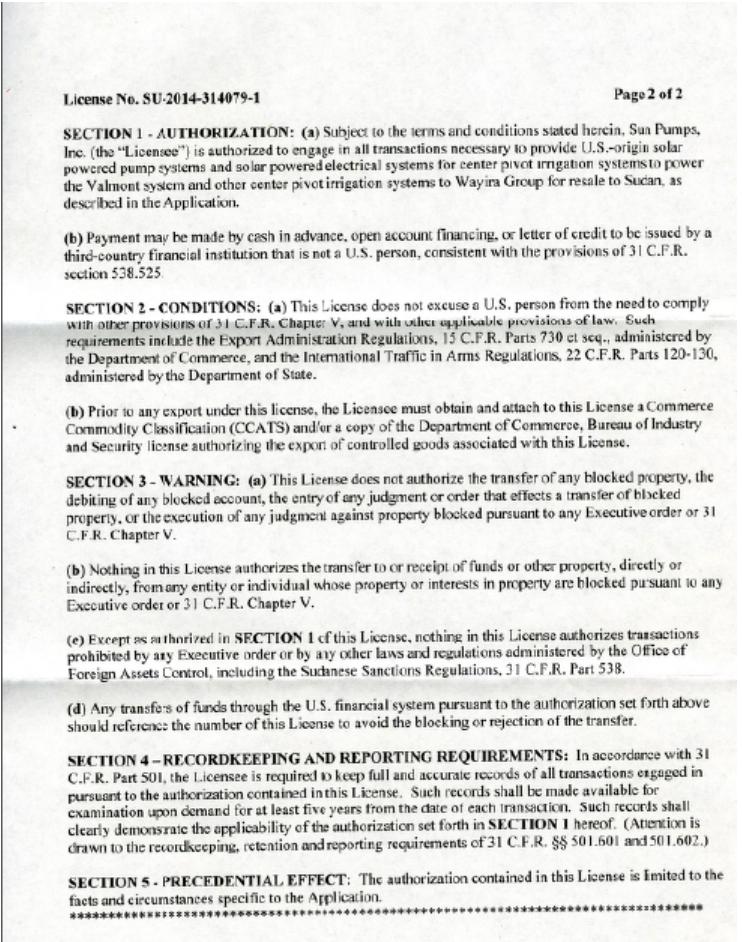
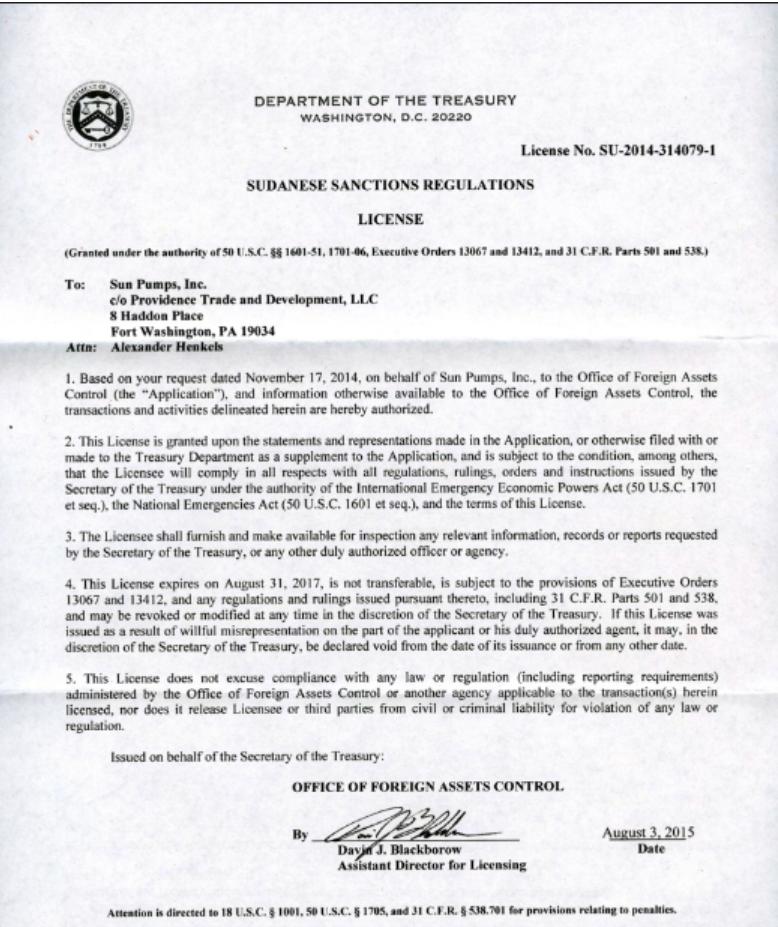


Industrial/ Technical

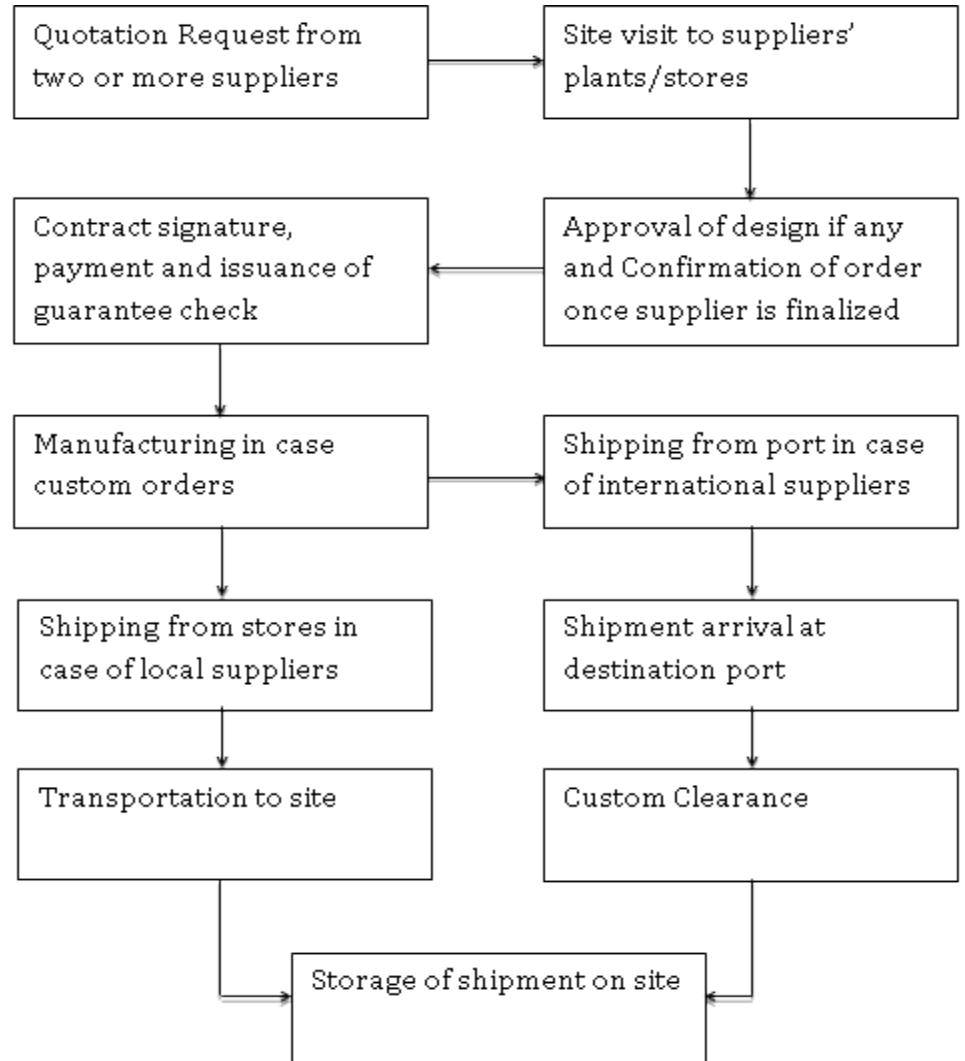


- Technical considerations such as the availability of spare parts, the supply chain for equipment and materials, support services for maintenance and repair.
 - No/ Lack of local qualified suppliers and subcontractors
 - Lack of availability of materials
 - Poor quality and delay of materials and work
 - Reliance on imports

License from Office of Foreign Assets Control

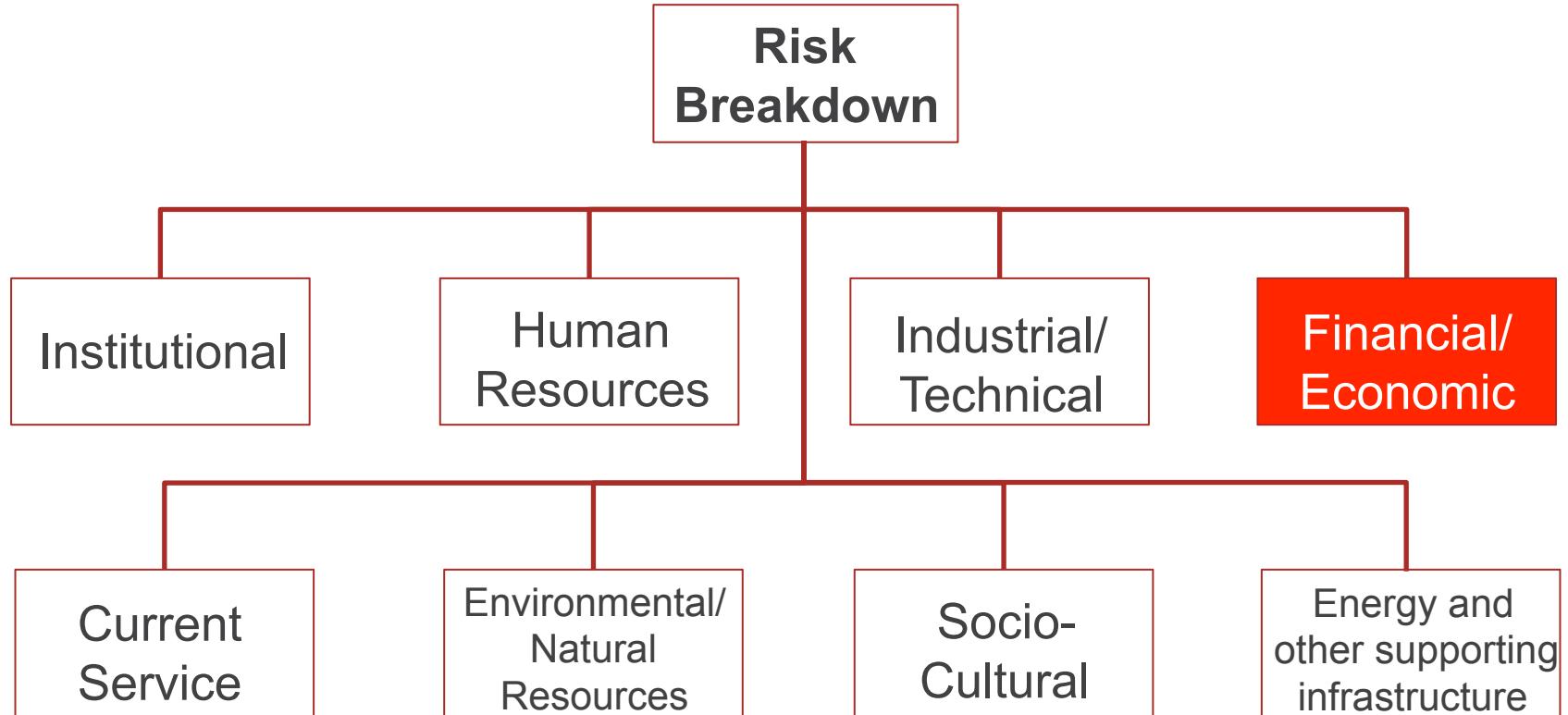


Supply Chain Plan

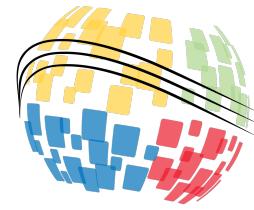


Risk Breakdown Structure

Level1



Financial / Economic



- Economic/financial mechanisms for securing private service provision, financing capital improvements and operating expenses, and options for collecting fees for service.
 - Delay in Availability of funds
 - Problem with User fees

Environmental



- Environmental/natural resources set constraints on the geography and manner of resource procurement, the rate of resource consumption, and the lifecycle impacts of supplying the service
 - Dry well?
 - Recharge rate
 - Natural disaster

Energy and other support infrastructure



- Energy availability, cost, and reliability determine the types of technology that can be employed
 - Lack of electricity grid

Socio-cultural



- Socio-cultural capacity enablers include such items as cultural trends, demographics, population analytics
 - Tribes

Current Service

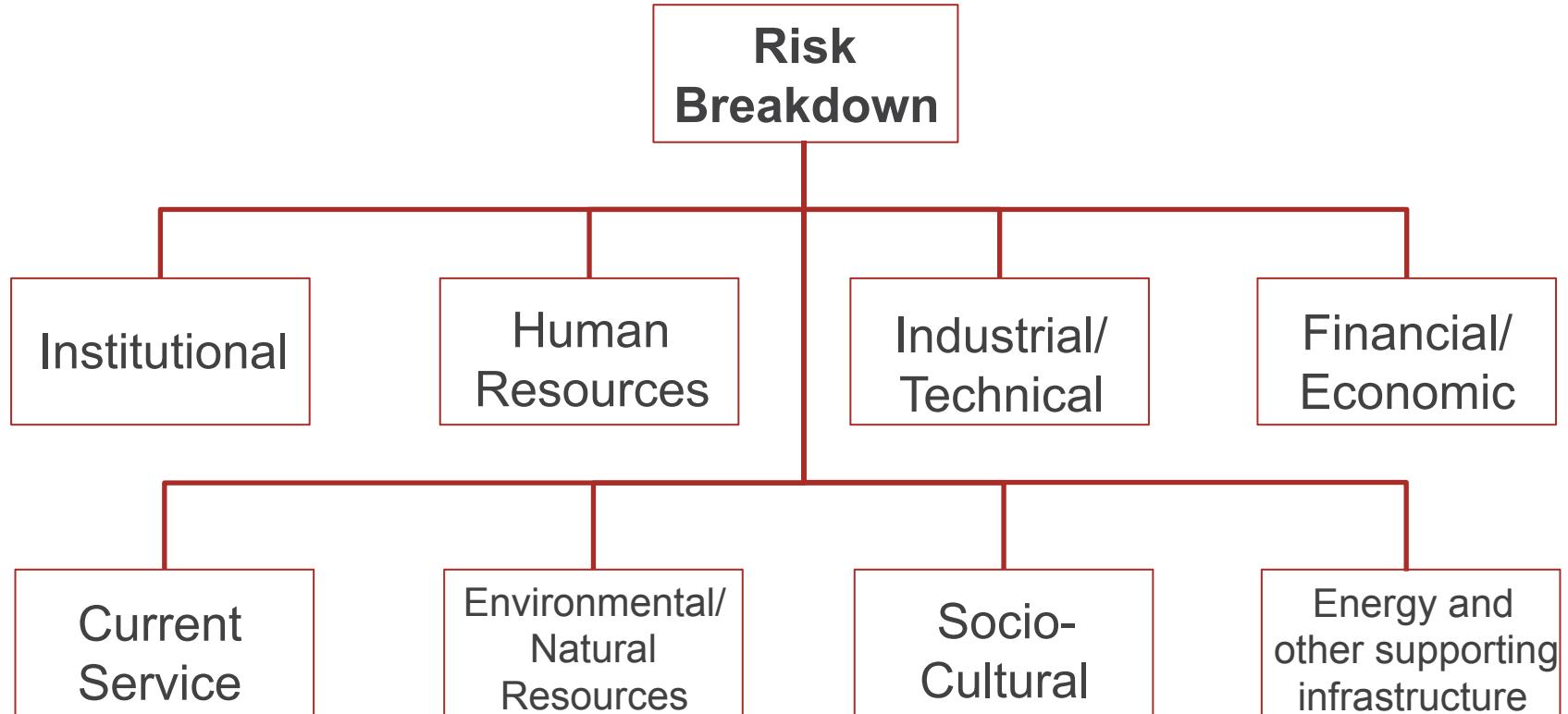


- Risk from existing service
 - Informal sector



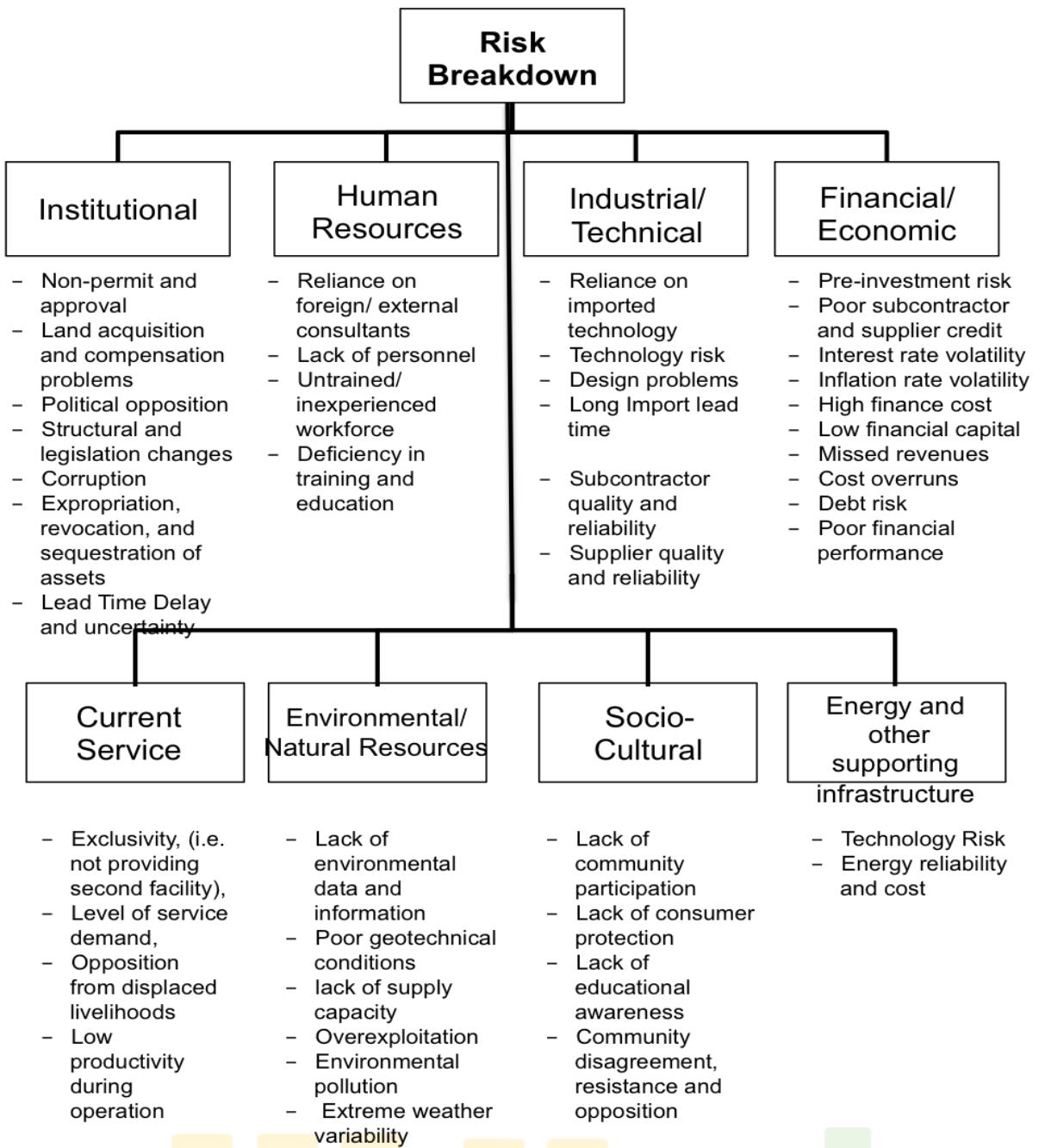
Risk Breakdown Structure

Level1



RBS

Level2

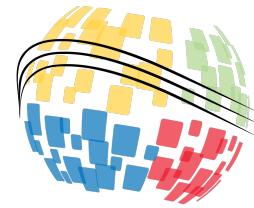


Risk Register



Risk #	Risk Statement (Ranked according to the Score)			Category	Probability	Impact	Score	Owner	Response Plan
	Risk	Cause	Effect						
1	Damage in improper Equipment and packing and Material		Lead to bad quality of final product and may lead to schedule delays.	Procurement	4	8	32	Project Manager	Follow with supplier to ensure proper packing is done as per the contract
2	Delays from supplier to deliver equipment and materials on time	Delay in manufacturing	Delay on the project schedule	Procurement	3	8	24	Project Manager	Close follow up with the Suppliers.
3	Required fund will not be available on time	Payment to the Client	Lead to delay in project schedule	Financial	3	8	24	Project Sponsor	Availing funds through Wayira resources.
4	Delay in commissioning	Delay from the Subcontractor Side	Lead to delay in the project schedule	Project Management	3	5	15	Project Manager	Early communication with the subcontractors to be ready according to project schedule.
5	Poor quality of equipment and materials	Supplier not Committed to quality of the agreed final product specs	Lead to low quality of the final product and may lead equipment to schedule delay	Quality	3	5	15	Project Manager	1/A contract to be signed with the supplier to ensure his commitment to the delivery dates required by Wayira 2/Close follow up with supplier to ensure deliverables are done according to the schedule baseline.
Total Project Risk Score (Sum of Risks Scores/Number of Risks)							22		

Status Update



<http://wayira.com/en/index.html>



Community Outreach



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www.incose.org/symp2017



Thank you

Supply Chain Plan



The following selection criteria were used to rank suppliers. Supplier with higher total weight is chosen to supply the item.

#	Criteria	Weight (1 – 100)
Quality aspects:	Vendor's technical specifications, techniques and solutions are meeting the technical requirements of WEC.	40%
Price:	Offered prices by the vendor are meeting the expected price of WEC.	30%
Delivery time:	Proposed delivery time by the vendor is meeting the milestone required by WEC.	10%
Scope:	Vendor's offered product specifications are meeting the customer's requirements.	10%
Previous Experience:	Vendor previous similar experience with the contractual requirements. Or known experience to the company management.	10%
Total		100

Quality Assurance Plan



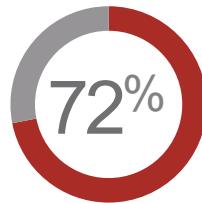
- Every operational component of the project is checked, inspected and tested through:
 - Inspections (visual/mechanical/electrical)
 - Functional tests
 - Sample inspection
- Clear metrics that are applicable to all phases of the project are set.



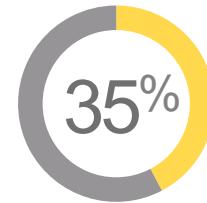




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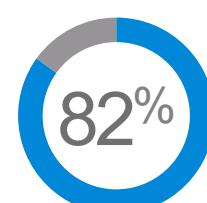
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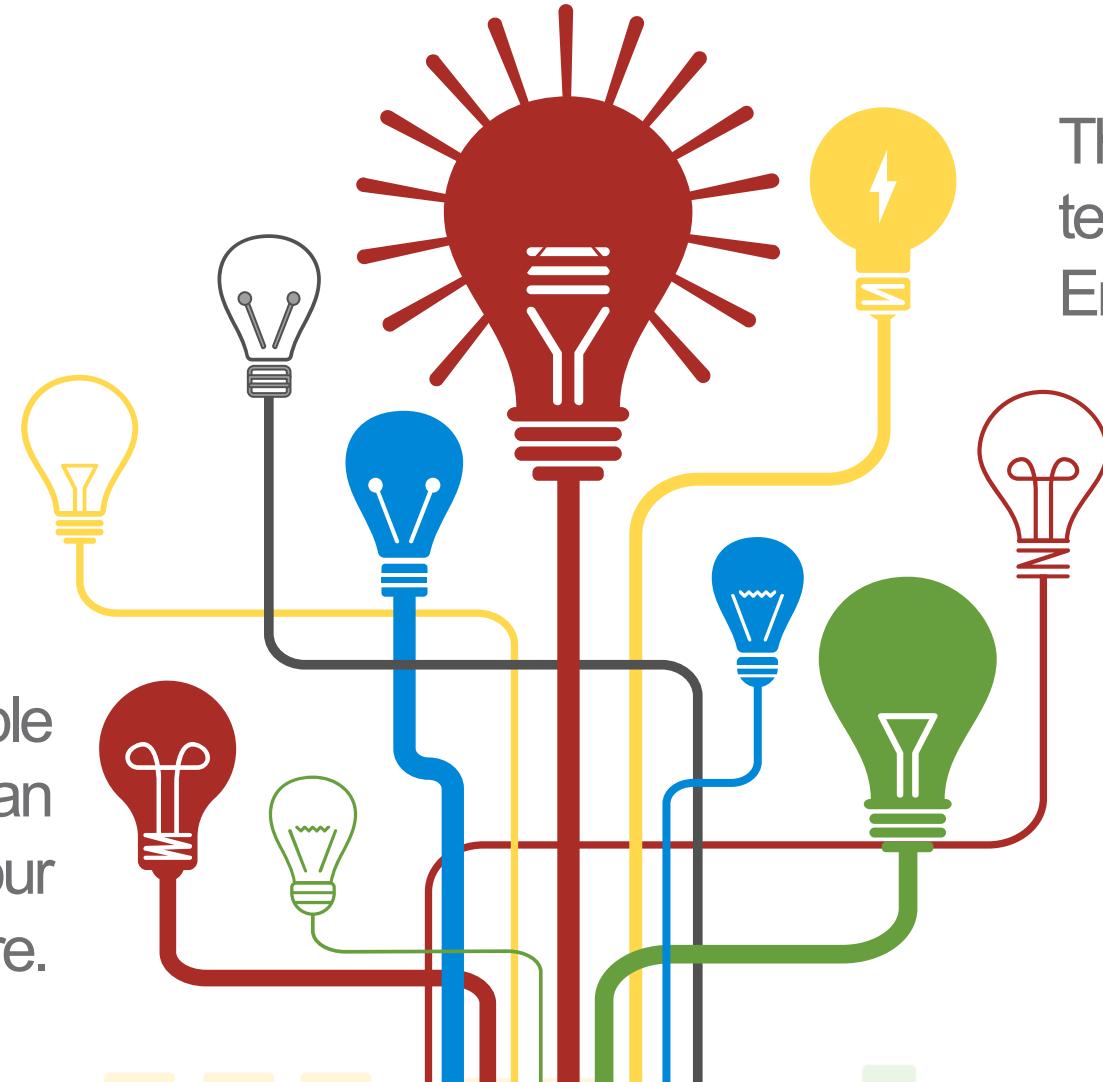
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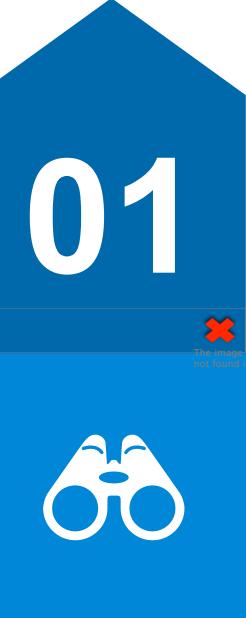
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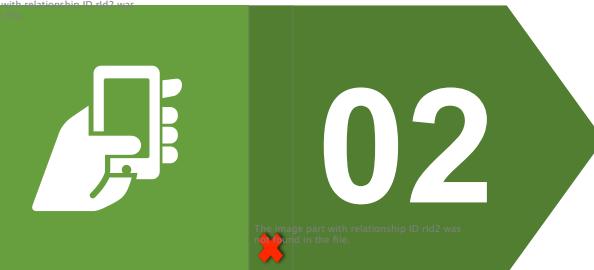
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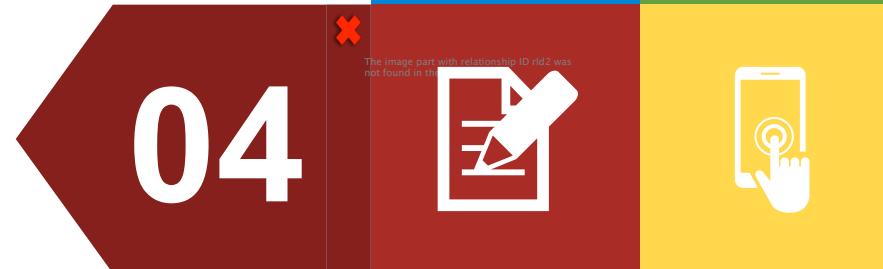
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Section 01



Section 02



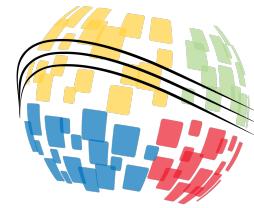
Section 03



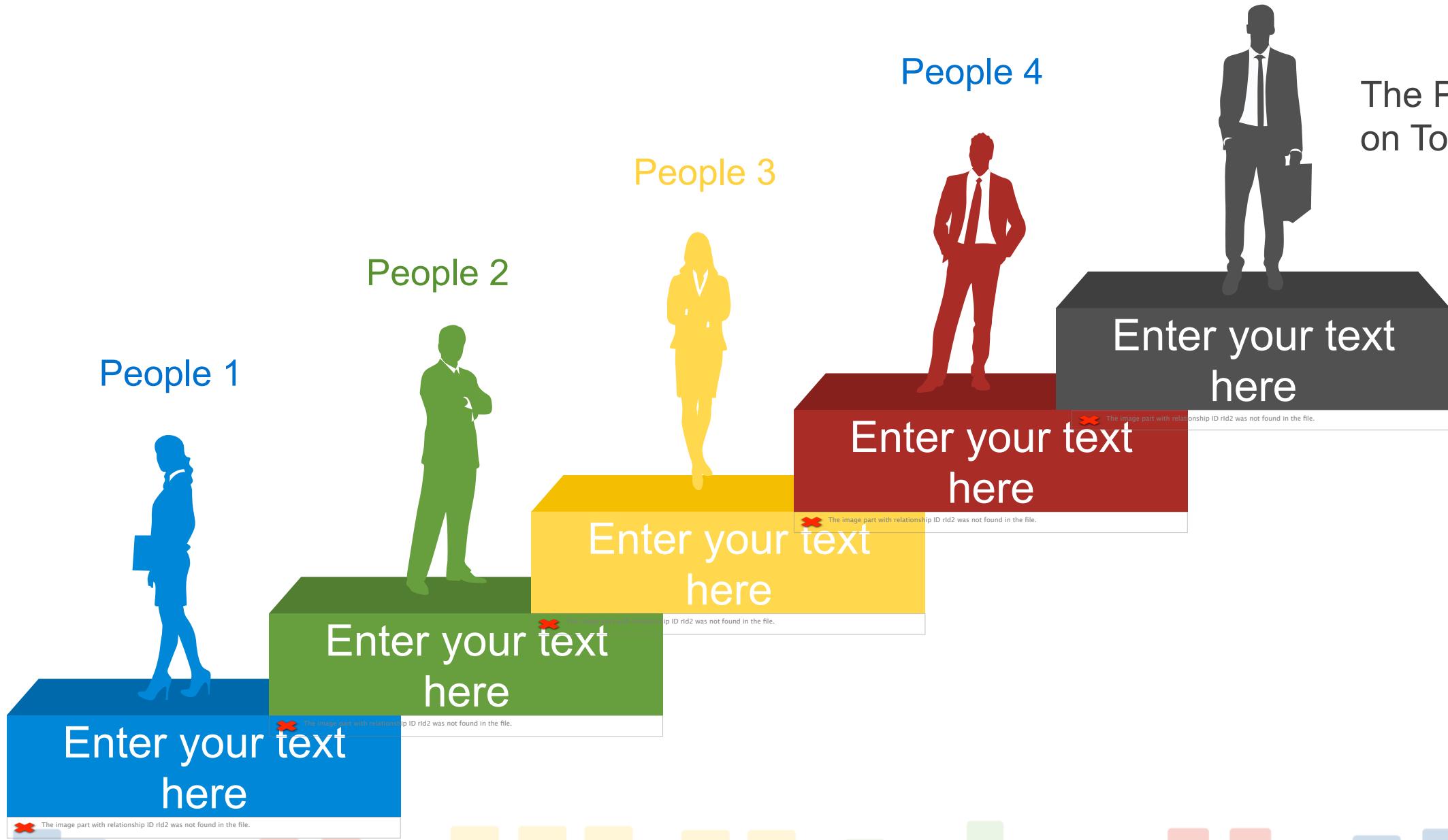
Section 04



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The People
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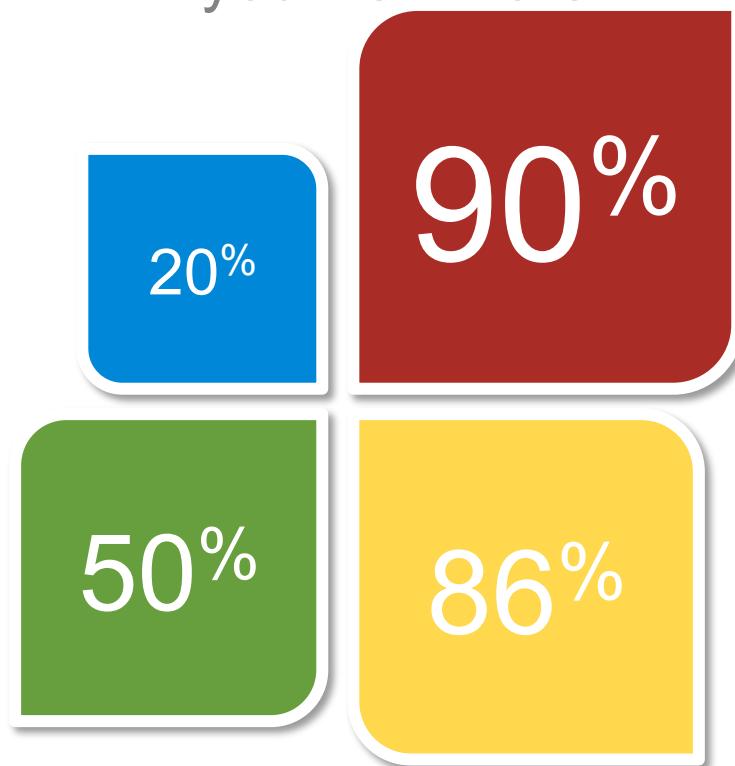
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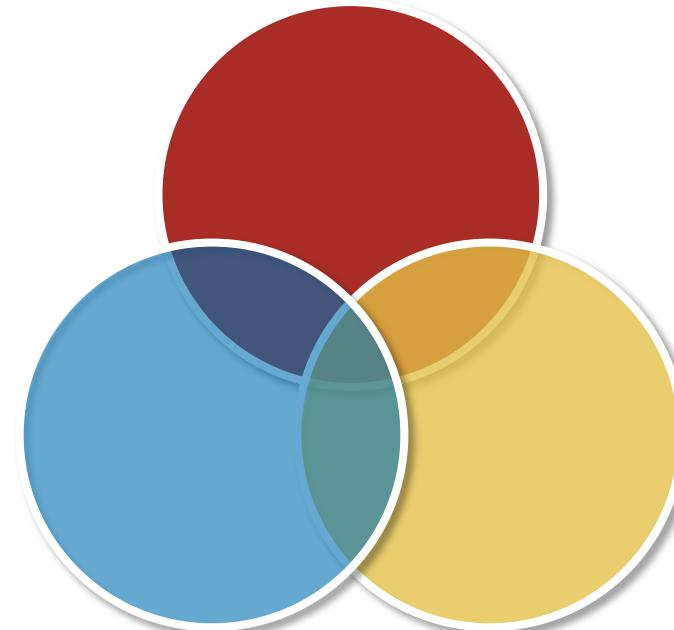
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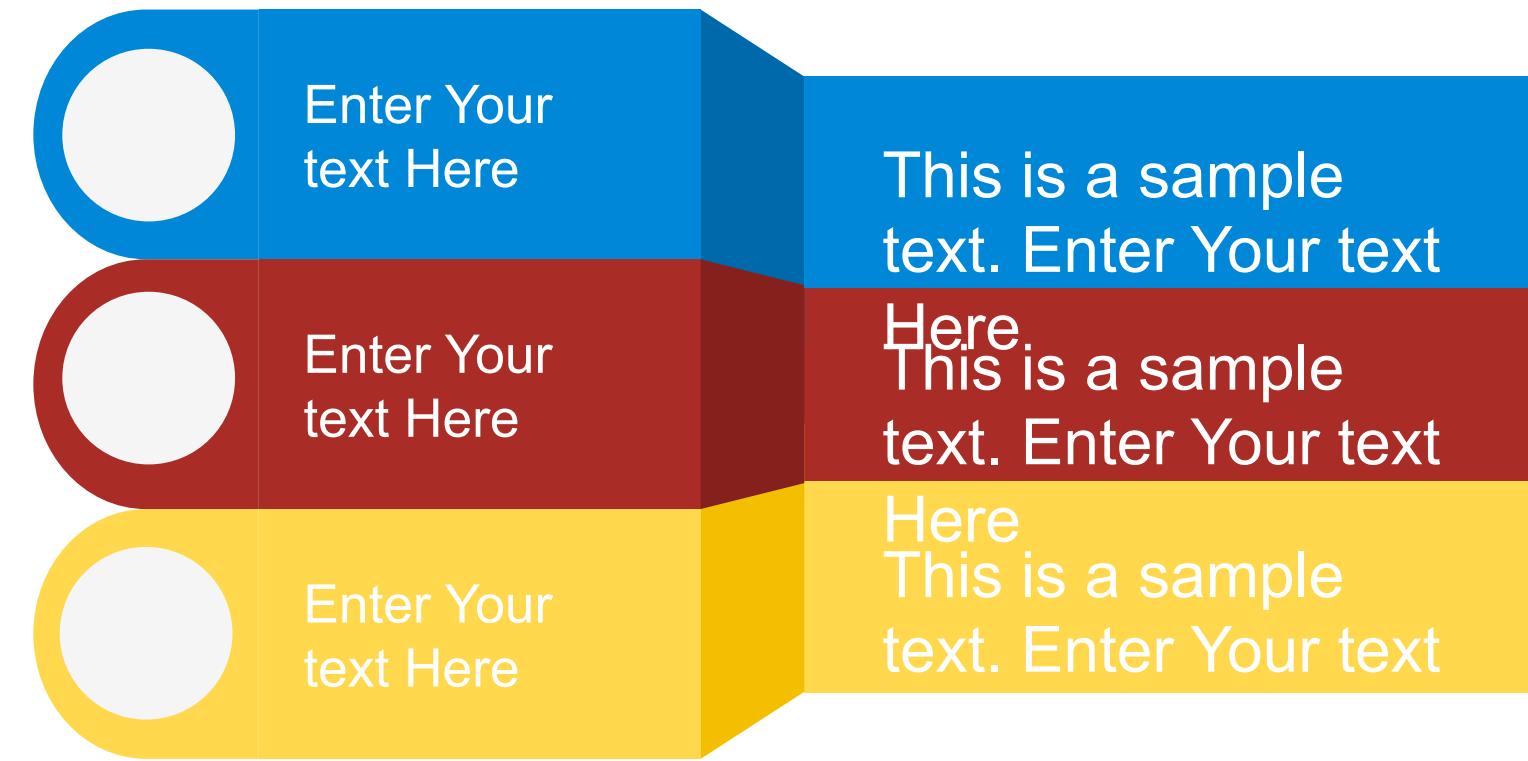
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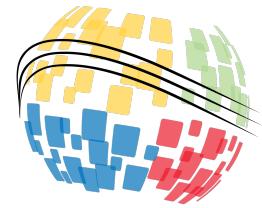


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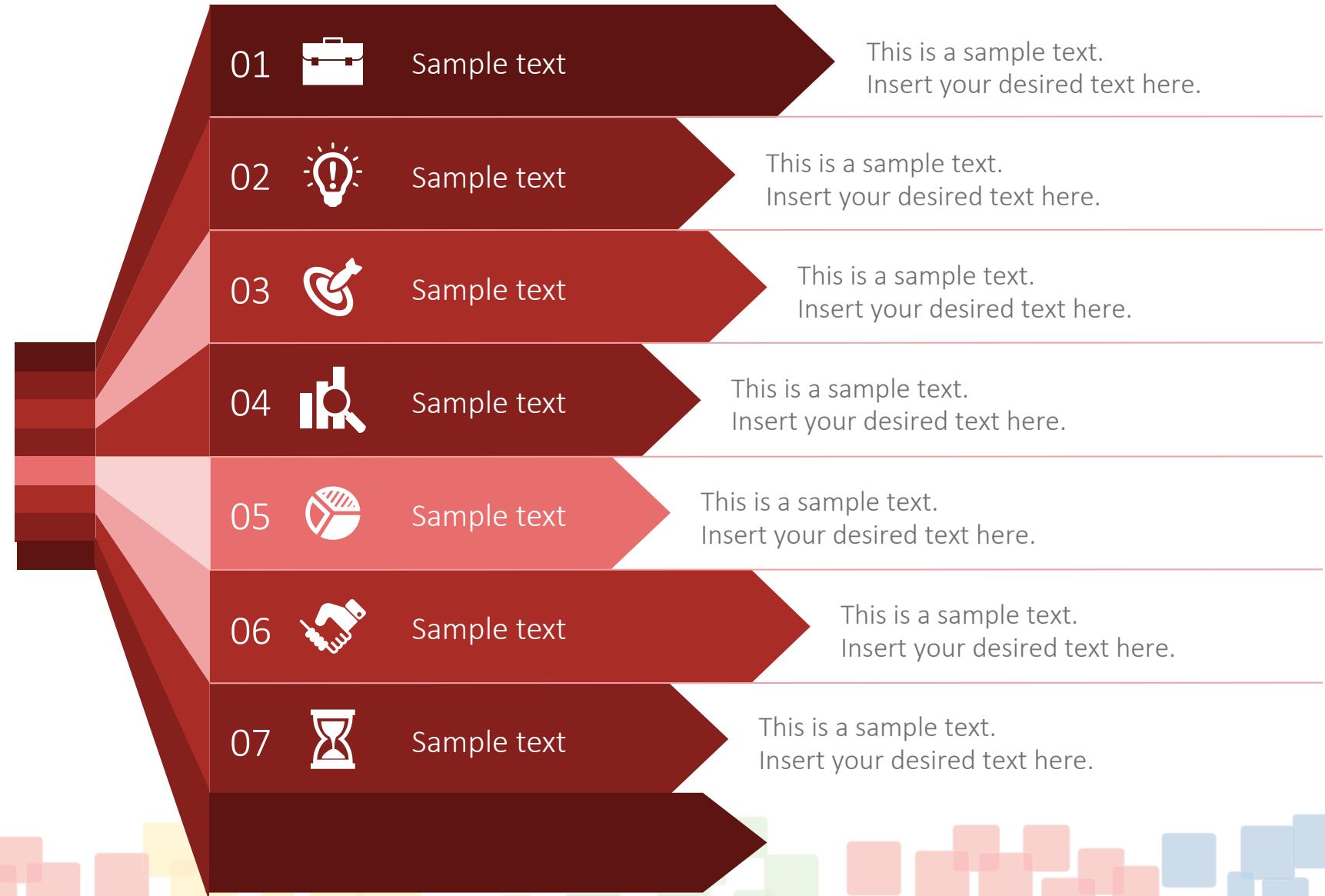
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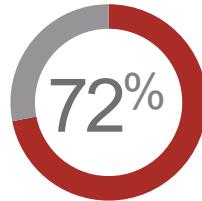
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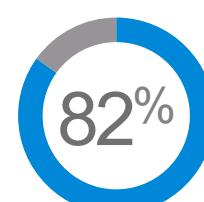
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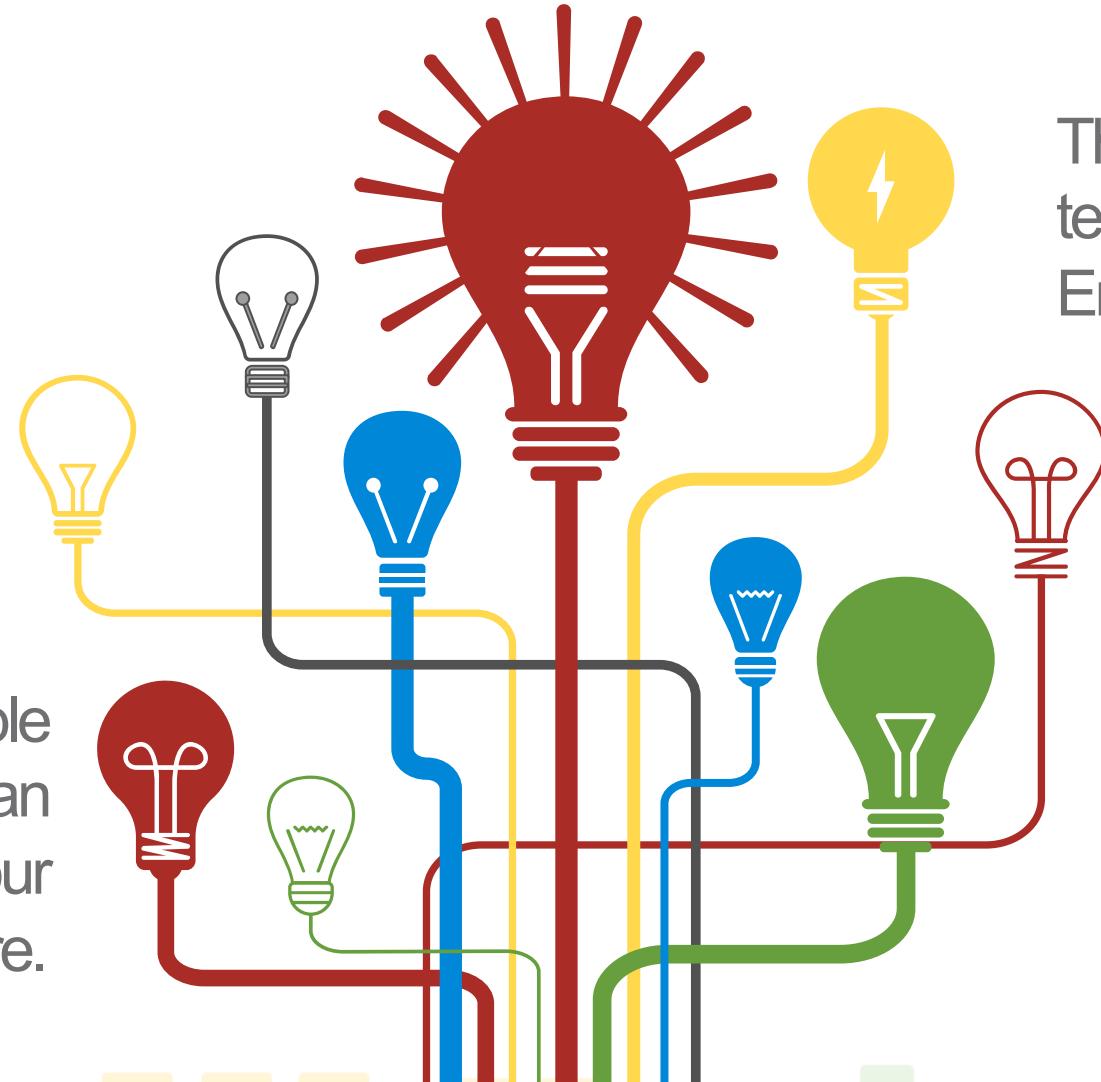
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Section 01



Section 02



Section 03



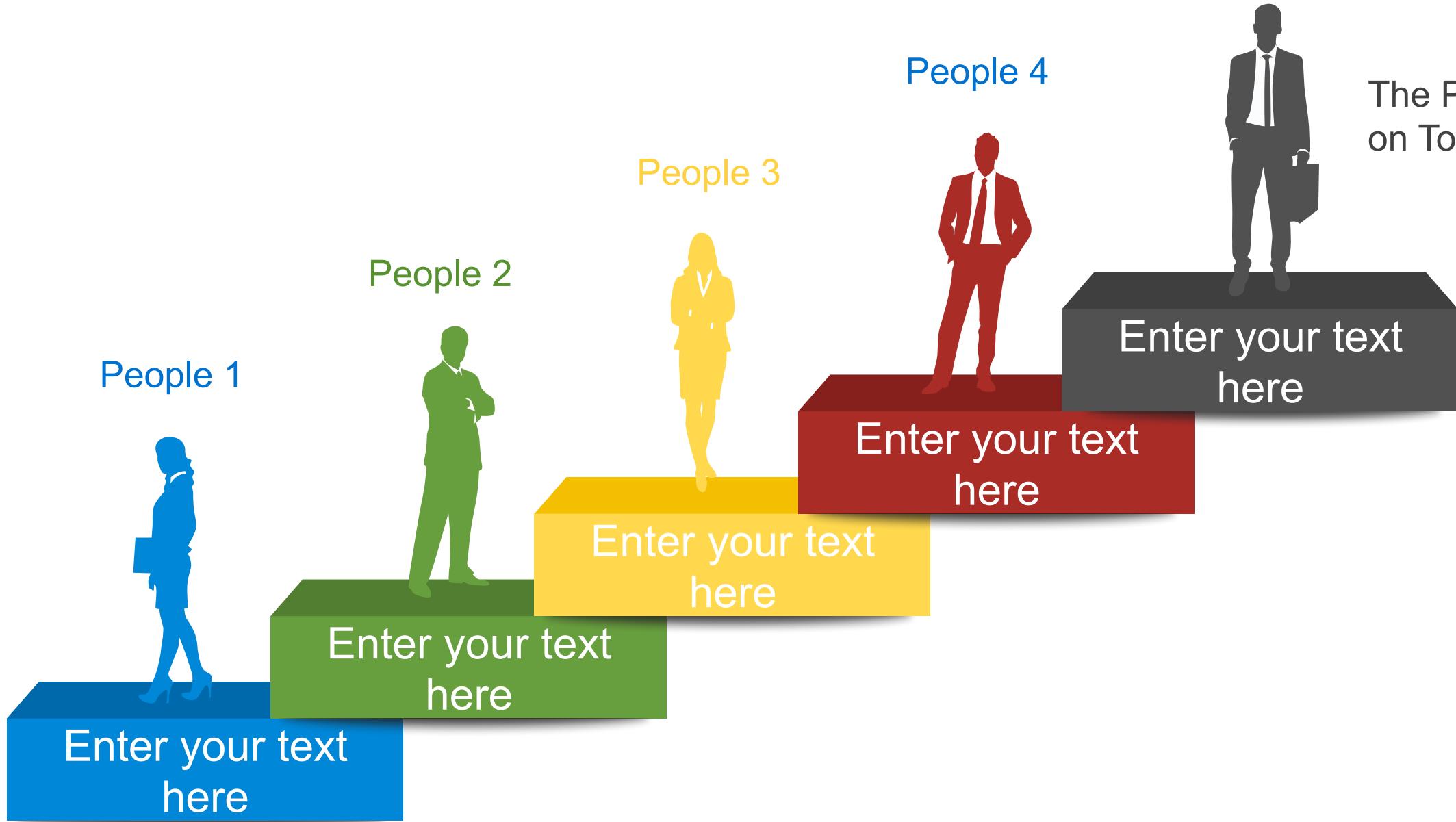
Section 04



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The People
on Top





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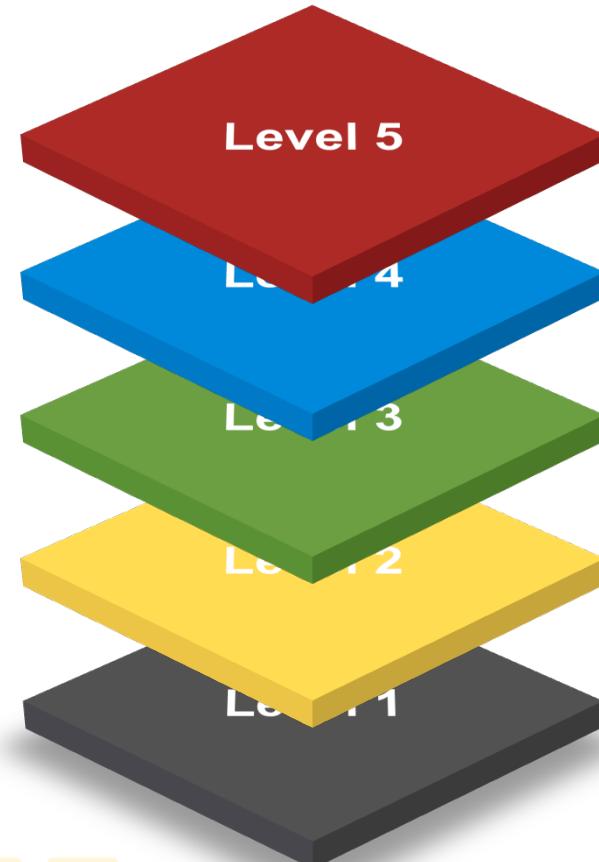
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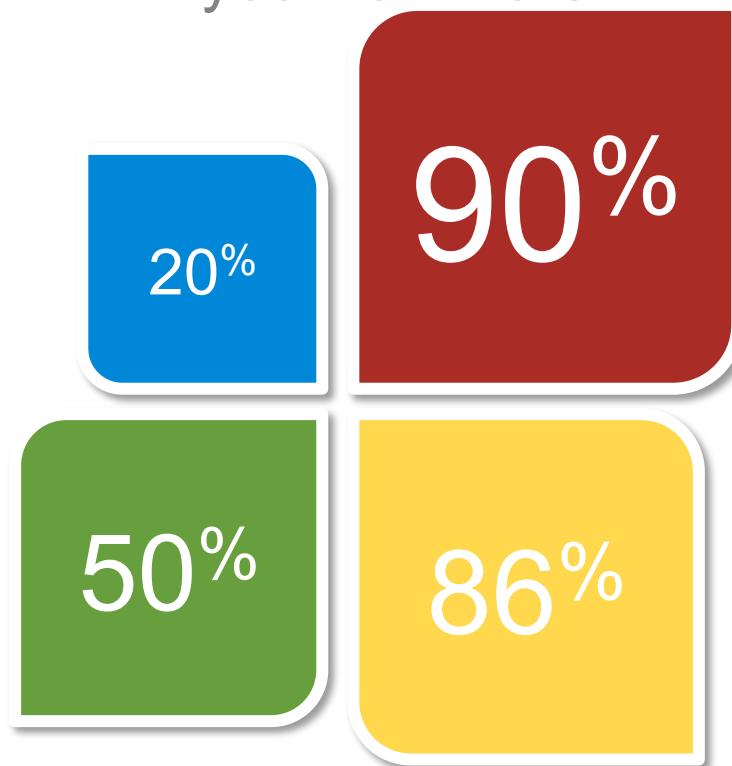
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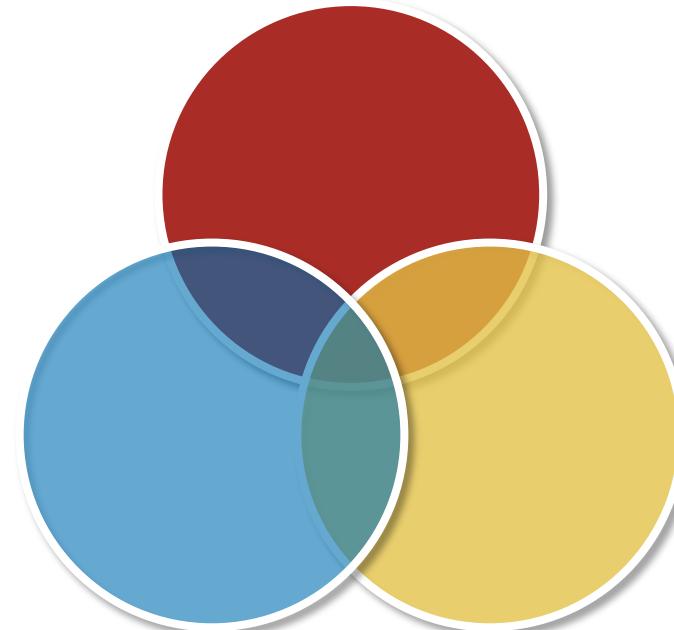
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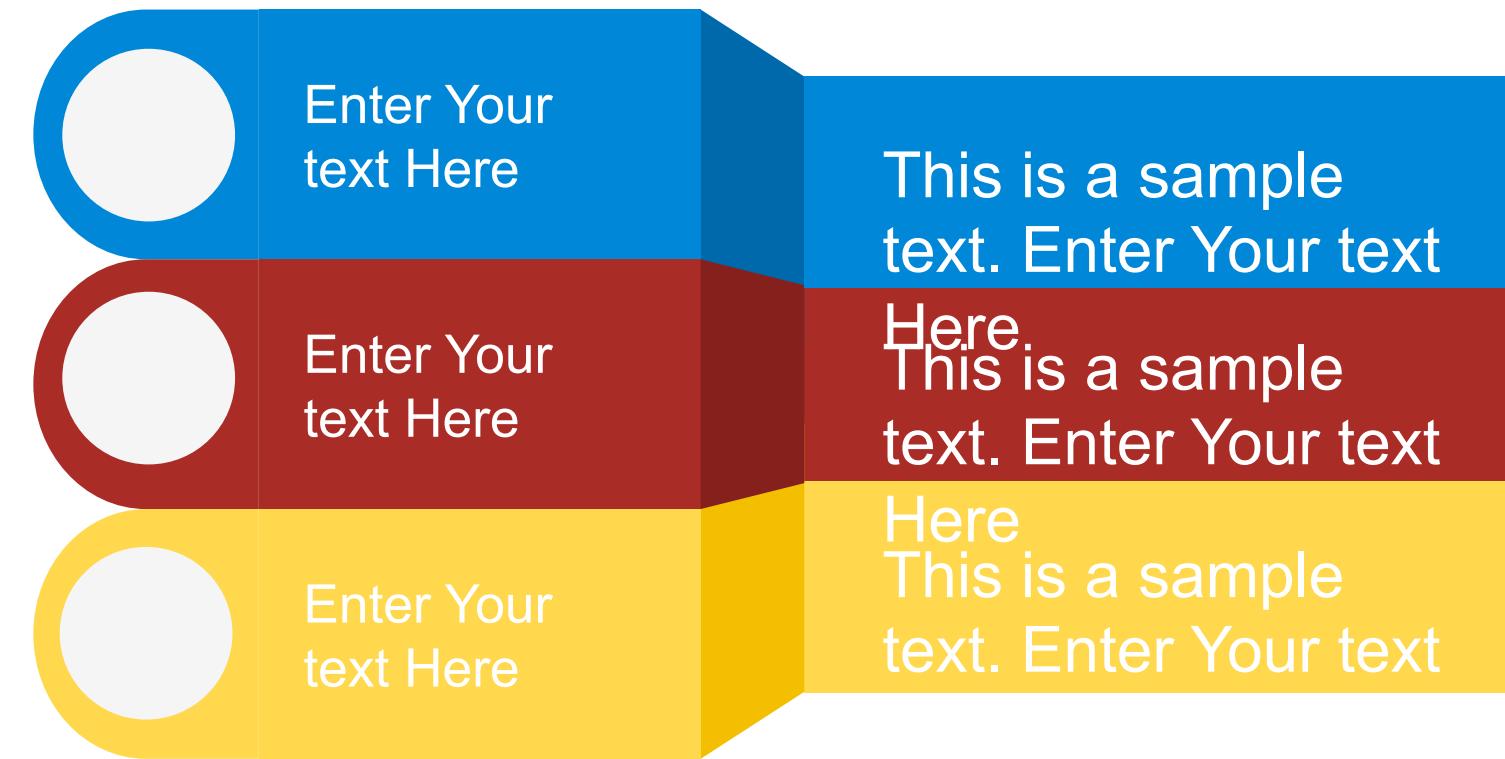
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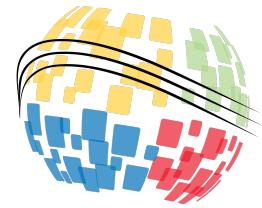
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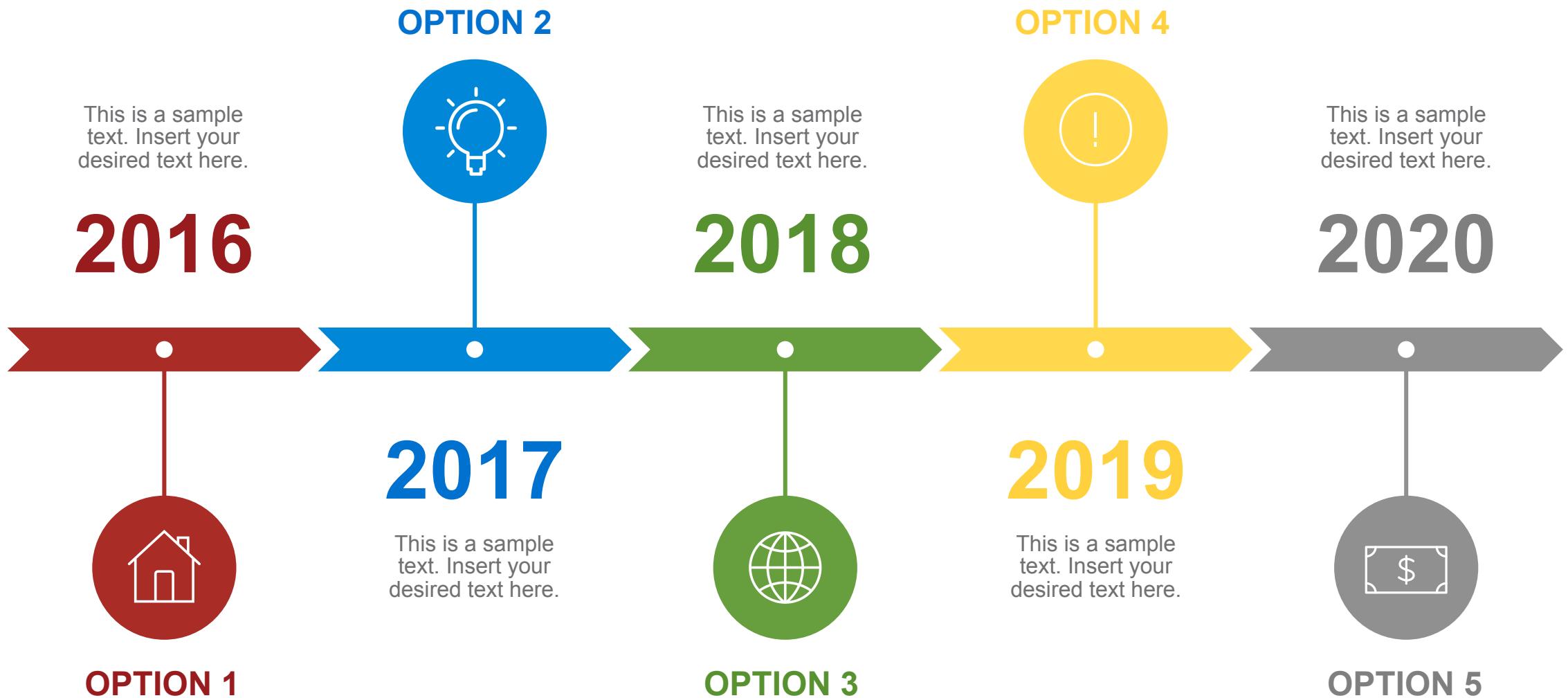
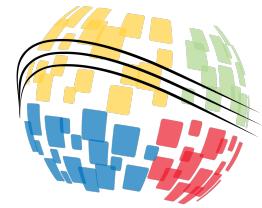
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