

# Xavier Institute of Management, Bhubaneswar

## Elective for BM

### Course Outline

Course Code		Term	V
Title of the Course:	<b>SYSTEM DYNAMICS FOR STRATEGY FORMULATION AND IMPLEMENTATION (SDSFI)</b>	Credit:	3.0
Name of the Faculty:	<b>Dr. Santosh K Prusty</b>		
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### COURSE DESCRIPTION

Managers of the VUCA world requires an in-depth understanding of “complexity” and “dynamics” of the business environment to devise “holistic” and “robust” strategies and implement for superior performance. The understanding residing in their “mental models” guides the manager in managing a business. However, managers as human beings are limited in their “capability” to understand the complexity of nature because of their “bounded rationality”. Hence, they do many of the times take “sub-optimal” “quick-fix” decisions that fail to generate a “sustainable competitive advantage” for the firm in the long run. “System Dynamics” methodology, originated at Massachusetts Institute of Technology, USA by Jay Forrester, provides an effective way for understanding the “complexity” of “systems” through a “dynamic” view.

This System Dynamics for Strategy Formulation and Implementation (SDSFI) course is designed for MBA participants: (1) to understand the complexity of business strategy and model the business strategy using System Dynamics methodology, and (2) to the dynamic model to support strategy implementation. The course is positioned within the purview of the “business strategy/competitive strategy” domain where “performance” is the ultimate “goal” of the firm and a “manager” has the responsibility of driving the “firm/organization” to achieve superior performance. ”

The course will be helpful for MBA participants who are aspiring to take career choices in strategy, general management, management consulting, and overall leadership roles.

In this course, we focus on developing objective skills of a manager like:

- *how to identify and define a strategic problem dynamically,*
- *what data to gather, identify data sources, and how to analyze data for strategy formulation,*
- *how to build and visualize systemic view of the strategic problem formulated,*
- *how to forecast the consequences of strategic decisions, and*

- *how to amplify strategy for implementation process through the modeling process.*

building through system dynamics modeling methodology.

## COURSE OBJECTIVES

1. To understand complexity in the context of business and strategy,
2. To acquire systems thinking skill and develop managerial holism
3. To formulate strategy through System Dynamics modeling.
4. To use the System Dynamics Models of the Strategy for implementation decisions.

## LEARNING OUTCOMES

The participants are expected to learn a fact-based structural approach to the management of an organization and enhance their skill of visualizing the business as a system of interconnected and auto-correlated factors in a linear and non-linear fashion and together affecting the dynamic performance of the business. In particular, the participants are expected to learn and acquire:

Sl	Learning Outcomes	Principal Evaluation Method(s)			
		CP	Quiz	Project	End Term
1	Ability to identify a strategic problem of the firm as a “dynamic and complex” problem.	Y	Y		Y
2	Ability to conceptualize the structure and system underlying the dynamics of the problem.	Y	Y		Y
3	Ability to develop a model of the structure and system underlying the strategic problem in the form of a “Causal Loop Diagram (CLD)” and “Stock-Flow Diagram (SFD)”.	Y		Y	Y
4	Ability to convert the “Stock-Flow Diagram” as an executable computer model.	Y		Y	
5	Ability to simulate the computer model, learn, and formulate a strategy.	Y		Y	
6	Ability to use the model – “Causal Loop Diagram (CLD)” and “Stock-Flow Diagram (SFD)” – as implementation tools.	Y			

## COURSE REQUISITES

Participants need to have basic understandings of business strategy.

## PEDAGOGY / TEACHING METHODOLOGY

Participants will be introduced to “Vensim” software – a platform for modeling complex systems and executing the system in a “flight-simulator” fashion – to understand underlying complexity and dynamic behaviors of strategic problems. The pedagogy will be primarily involving problem formulation exercises, discussion, and demonstration method. The students are expected to invest in practicing model building off-the-class as per the advice of the course instructor. This is a course focusing on “skill development” hence “learning-by-doing” is the “*mantra*” for acquiring the skill.

Download Vensim Software: [<http://vensim.com/free-download/>].

## EVALUATION

Component	Weightage %
Class Participation Evaluated Through Project Model Every Class	20
Quiz	10
Individual Assignment	-
Group Assignment	-
Take Home Assignment	-
Attendance	-
Research Article Review/Discussion	-
Project* [Submissions (10+10) + Presentation (10)]	30
Mid Term	-
End Term	40
TOTAL	100

\*The participants in a group of 4 need to choose an organization and identify its strategic problem, write a story depicting the problem and submit report. At the end they need to produce a strategic architecture of the strategy as a Vensim file. The story and the Vensim file carries maximum of 10 marks each. Towards end of the course they need to present their project work carrying a maximum of 10 marks. Hence, **three** submissions are due to the participants, e.g. **Report, Vensim File, and Power Point Presentation** before the end term exam.

## DETAILS/INSTRUCTIONS FOR EVALUATION: NIL

## TEXT BOOKS

- Warren, K. (2009). *Building Strategy and Performance through Time*. Business Expert Press.
- Case Book Designed by Instructor

## ADDITIONAL BOOKS / READINGS:

- Sterman, J. D. (2010). *Business Dynamics: Systems Thinking and Modeling for a Complex World*. Tata McGraw-Hill.
- Journals: Wall Street Journal, New York Times, Financial Times, HBR, etc.
- Annual Reports of Companies

## SCHEDULE OF SESSIONS

#	Topic	Learning Material (Textbook/Case/Article)	Learning Objective
1	<ul style="list-style-type: none"> <li>Why Modeling?</li> </ul>	<ul style="list-style-type: none"> <li>TBP</li> </ul>	<ul style="list-style-type: none"> <li>To understand why modeling of strategic problems is required before it is implemented.</li> </ul>
2	<ul style="list-style-type: none"> <li>Dynamic Problem</li> <li>“Reference Mode of Behavior”</li> </ul>	<ul style="list-style-type: none"> <li>Chapter 1: Performance through Time</li> </ul>	<ul style="list-style-type: none"> <li>To understand why “Performance-Through-Time” is critical</li> <li>To develop a time-based picture of challenges organizations face.</li> </ul>
3	<ul style="list-style-type: none"> <li>Critical Factors in a System</li> <li>Resource-for-Value Identification</li> </ul>	<ul style="list-style-type: none"> <li>Chapter 2: Resource: Vital Drivers of Performance</li> </ul>	<ul style="list-style-type: none"> <li>To identify the resource as the critical system variable and to define and measure it.</li> <li>To understand the link between “resource” and “performance”</li> </ul>
4	<ul style="list-style-type: none"> <li>Levels and Rates in Systems</li> <li>Understanding and Managing Resource Level</li> </ul>	<ul style="list-style-type: none"> <li>Chapter 3: Resource and Bathtub Metaphor</li> </ul>	<ul style="list-style-type: none"> <li>To understand how managers can develop and manage resources in organizations.</li> </ul>
5	<ul style="list-style-type: none"> <li>Cause-and-Effect</li> <li>Interdependence of Resources</li> </ul>	<ul style="list-style-type: none"> <li>Chapter 4: Driving the Machine: Handling Interdependence between Resources</li> </ul>	<ul style="list-style-type: none"> <li>To understand the interdependence of resources in the organization and how the resource can drive their own growth and decline</li> </ul>
6	<ul style="list-style-type: none"> <li>Causal-Loop-Diagram (CLD), Stock-Flow-Diagram (SFD), and Hybrid Diagrams as the Structures of System</li> </ul>	<ul style="list-style-type: none"> <li>Chapter 5: Building and Managing the Strategic Architecture</li> </ul>	<ul style="list-style-type: none"> <li>To develop the complete strategic architecture of organization involving performance, resources, and their interdependence that drives the dynamic behavior</li> </ul>
7-8	<ul style="list-style-type: none"> <li>Generic Dynamic Behavior of Systems</li> <li>System Archetypes</li> </ul>	<ul style="list-style-type: none"> <li>Article: Generic Structure and Behavior of Systems</li> </ul>	<ul style="list-style-type: none"> <li>Linking dynamic problems (generic) to generic structures</li> </ul>
9-10	<ul style="list-style-type: none"> <li>Building the Model over Vensim</li> </ul>	<ul style="list-style-type: none"> <li>Workshop on introducing Vensim as a computer platform to build a system dynamics model for simulating the model of strategic problem</li> </ul>	
11	<ul style="list-style-type: none"> <li>Attributes of Level</li> <li>Resource Quality</li> </ul>	<ul style="list-style-type: none"> <li>Chapter 6: You Need Quality Resources as well as Quantity</li> </ul>	<ul style="list-style-type: none"> <li>To assess the “quality of resources” and how to improve it.</li> </ul>
12	<ul style="list-style-type: none"> <li>System Boundary and Exogenous Effect</li> <li>External Environment</li> </ul>	<ul style="list-style-type: none"> <li>Chapter 7: Managing Rivalry for Customers and other Resources</li> </ul>	<ul style="list-style-type: none"> <li>To understand customer dynamics in the presence of rivalry between the firm and the competitors</li> </ul>

13	<ul style="list-style-type: none"> <li>• Truth and Beauty of Model</li> </ul>	<ul style="list-style-type: none"> <li>• TBP</li> </ul>	<ul style="list-style-type: none"> <li>• To verify and validate a model for the true and valid representation of the strategic problem</li> </ul>
14-15	<ul style="list-style-type: none"> <li>• Understand Business Strategy through System Dynamics Model</li> </ul>	<ul style="list-style-type: none"> <li>• Dogfight over Europe: Ryanair (C) [HBS Case]</li> </ul>	<ul style="list-style-type: none"> <li>• To understand the consequences of various choices made by Ryanair in 1991 towards low-cost strategy.</li> </ul>
16-17	<ul style="list-style-type: none"> <li>• Understand Corporate Strategy through System Dynamics Model</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft in 2005 [HBS Case]</li> <li>• Bill Gates and Management of Microsoft [HBS Case]</li> </ul>	<ul style="list-style-type: none"> <li>• To understand the strategy of adopting a mix of business and corporate strategy for growth.</li> </ul>
18	<ul style="list-style-type: none"> <li>• Learning and Strategy Implementation through Modeling Strategy</li> </ul>	<ul style="list-style-type: none"> <li>• Article: Modeling as Learning</li> </ul>	<ul style="list-style-type: none"> <li>• To understand the limitations of the traditional top-down implementation approach and moving towards engaging the organization in modeling activities and strategy implementation.</li> </ul>
19	<ul style="list-style-type: none"> <li>• Reflection and Feedback on Learning of Students</li> </ul>	<ul style="list-style-type: none"> <li>• Presentation by Students on the System Dynamics Model of Strategy developed by them</li> </ul>	
20	<ul style="list-style-type: none"> <li>• Course Wrap Up</li> </ul>	<ul style="list-style-type: none"> <li>• Question and Answers</li> </ul>	

**ACADEMIC INTEGRITY:** Laptops are required in most of the sessions **after the 8<sup>th</sup> Session**. Participants are required to bring their own laptops to the classroom. As per the instruction of the instructor, the participants are required to work on the laptop in the classroom.

***“THE BASIC ASSUMPTION: We believe that everyone in the class is intelligent, capable, and cares about doing their best and wants to learn.”***