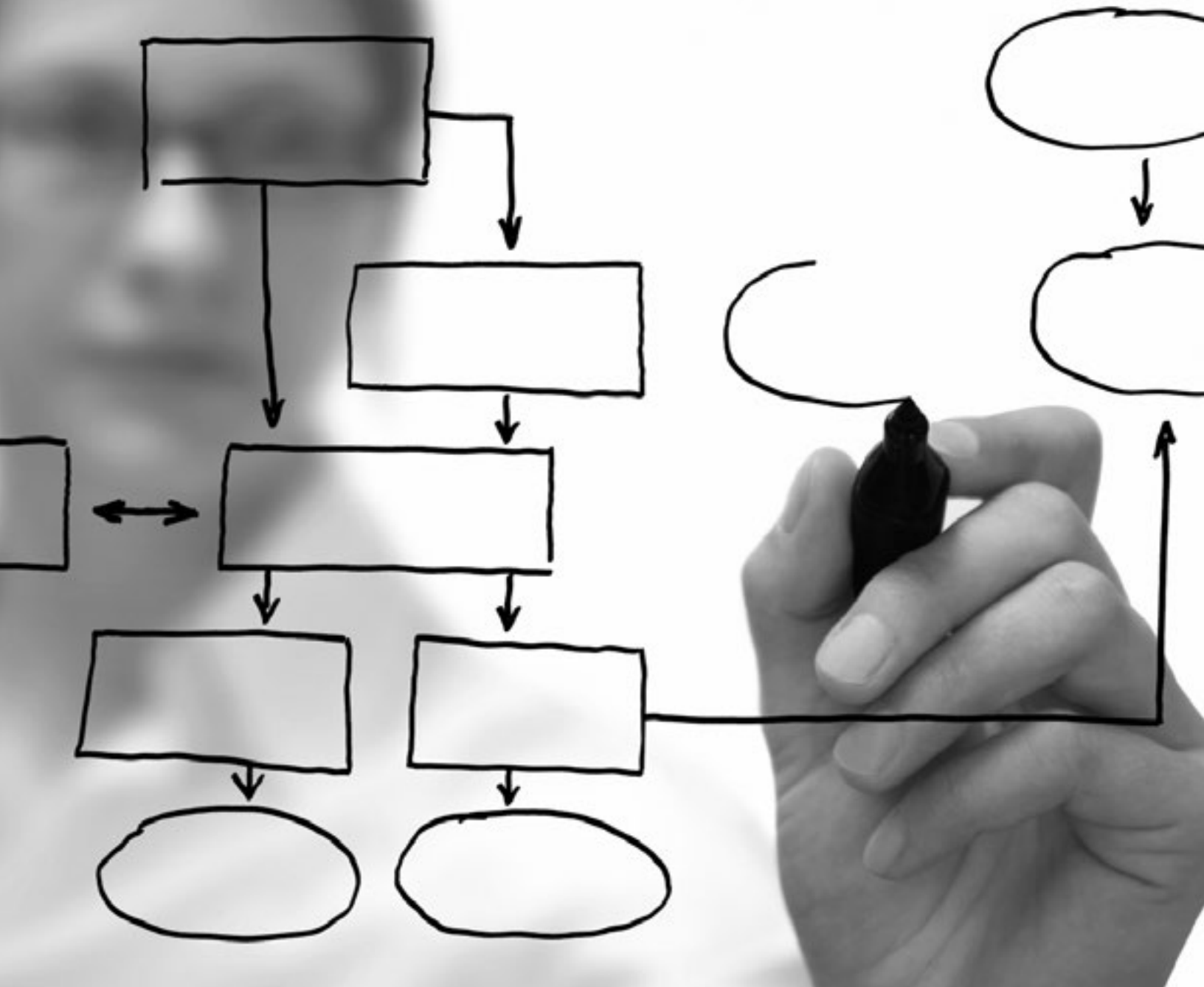


INTRODUCTION TO BUSINESS PROCESS MANAGEMENT: THE PAPER GAME

2nd Edition



Pierre-Majorique Léger, Ph.D.

Full Professor, Department of Information Technologies,
Director, ERPsim Lab | HEC Montréal

ERPsimLab
HEC MONTRÉAL

ISBN: 978-0-9866653-4-9

Introduction To Business Process Management: The Paper Game

2nd Edition

Pierre-Majorique Léger, Ph.D.

Full Professor, Department of Information Technologies,
Director, ERPsim Lab | HEC Montréal

Summary

In this simulation, students are introduced to business process management and the flow of business information through a paper-based game. In teams of 3 to 5, participants have to manage the operations of a paper manufacturing company. With the use of Post-it notes, they must design and operate a business process that will allow them to support their new company. In the debriefing, participants reflect on their information needs to support the value creation process for their customers.

Introduction

I first created this game in 2010 when I was asked to use ERPsim in an introduction to Management Information Systems (MIS) in the baccalaureate in business administration at HEC Montréal. We needed a simpler simulation game for this group of students and we decided to develop an ERPsim game without a production process. This led to the creation of the ERPsim Logistics Game, one of our most popular games nowadays.

But adapting ERPsim was not enough. I felt we were skipping steps by having students directly play the ERPsim game using SAP. Those undergrads had very limited business experience. They might have had some experience with some business functions, but most of them were probably never involved with the most basic processes of an organisation. How could we get students to appreciate the value of an enterprise system and how effectively it can support integrated business processes without such experience?

I felt that students needed a “tactile” experience with some very basic business processes. They needed to experience first-hand the flow of information needed to support simple business decisions related to buying, producing and selling a product. And more importantly, to understand the accounting processes underlying these business activities.

I thus came up with the idea of a simple game. A game that could be organized without any IT support, using material we would easily find in a college or a university. The production in the game process needed to be simple; thus the idea of cutting paper in squares squares (see figure 1). The production process is also fast and provides a strong contrast with the effort needed to manage the flow of information to keep the company afloat.

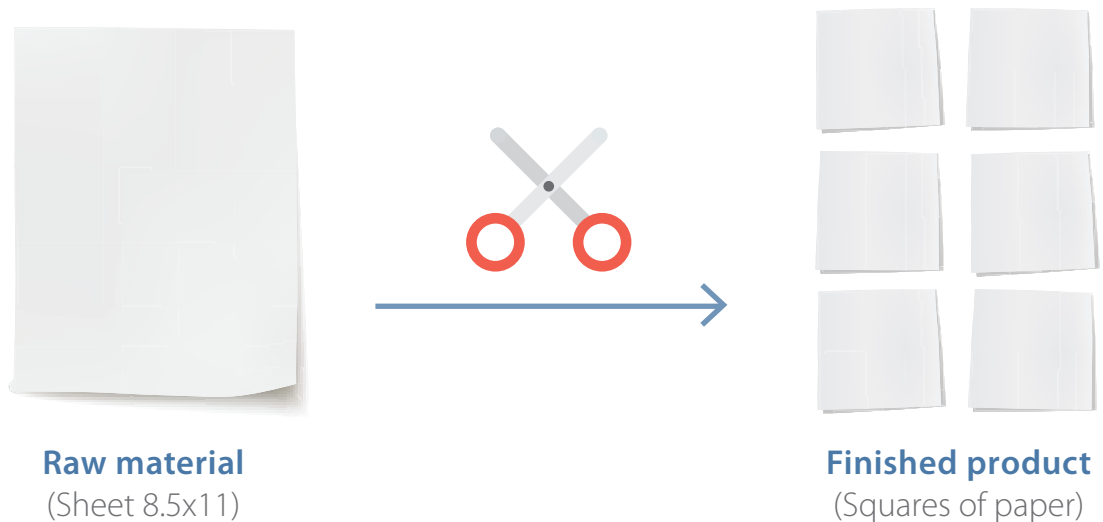


Figure 1: Producing squares of paper

The take-home message is surprisingly strong, and every time I have used this simple game it is really interesting to see the “Ah-ha!” moment on the student side. After the game, you ask them, “how much time where you creating value for your customers?” While the management of information flow is not completely valueless, it can certainly be argued that the transformation of the product, from a sheet of paper into squares, is probably the most important value activity. Typically, students will answer that they have spent on average 5 to 10% of their time cutting paper. My question for them is then “What were you doing the rest of the time?” The discussion then naturally turns to how information technologies can help to reduce the effort needed to manage information for a company, even for such a small paper company.

We now use this game in most ERPsim faculty training. While I don’t have the exact number of faculty members using it, there are probably several dozen universities and colleges using it as a preparatory step for the ERPsim game. I have personally used the game both with junior undergrads and even MBA students in top universities. The reaction is surprisingly always the same. And the transition into the ERPsim game becomes natural as they get to see how a real enterprise system can really reduce the administrative work.

In the next section, I will describe how I personally run this game. It should be noted that several variants have been developed by colleagues from various universities. I encourage you to write to me with your version to improve future versions of the game.

Required Material

Here is the list of material needed by each team. For a class of 60 students, you should plan for approximately a dozen teams.

Each team will need:

- Five packs of Post-it notes in different colours. For the purpose of these instructions, we will use yellow, blue, pink, green, and orange. If you don't have these specific colors, make sure to modify the slides accordingly .
- A pair of scissors
- Two sheets of light-coloured paper (not white).
- A plastic envelope to facilitate the distribution of the material to all teams.



Figure 2: Paper Game kit for each team

The instructor will need the following material to manage the game (see figures 2 and 3):

- Two 6-sided dice. You could also use a free mobile phone app such as “Virtual dice”.
- Two large white cards (3' by 5') referred to as the “Customer” matrix and the “Supplier” matrix. You can download a pdf version of these cards at the following address : https://erpsim.hec.ca/learning/games/paper_game
- Packs of white Post-it notes.
- A stack of sheets of white paper.
- A reminder sheet

ÉQUIPE / TEAM	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
A												
B												
C												
D												
E												
F												
G												
H												
I												
J												
K												
L												
M												
N												
O												

ÉQUIPE / TEAM	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
A												
B												
C												
D												
E												
F												
G												
H												
I												
J												
K												
L												
M												
N												
O												

Figure 3: Customer Matrix and Supplier Matrix



Figure 4: Instructor's kit

As shown in the following picture, you could replace the large white card with two flip charts. You will then need to draw a matrix with the teams and round numbers.

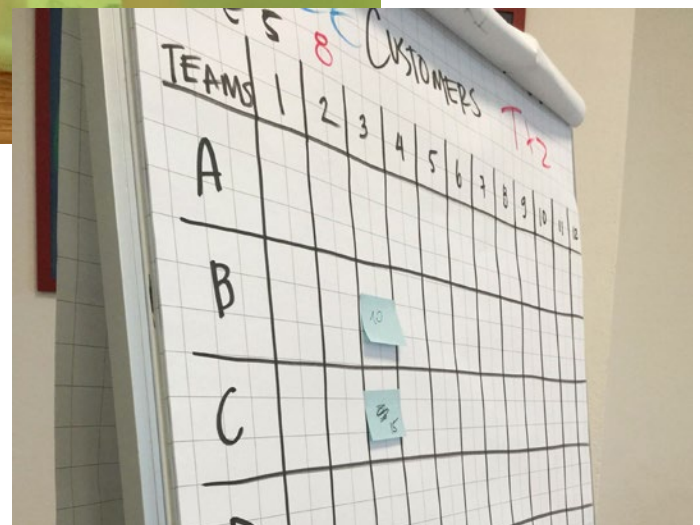


Figure 5: Flip charts

Game scenario

Each team of students manages a manufacturing company that purchases sheets of paper (for example 8" x 11"), and resells squares of paper (approximately 3.5" x 4" in size). Students must buy the paper from the supplier, receive the paper, cut it into 6 pieces, and resell the pieces of paper to the customer. On the financial side, students must pay their supplier and collect client payments. At any point in time in the game, students should be able to provide their current profit, accounts payable, accounts receivable and inventory.

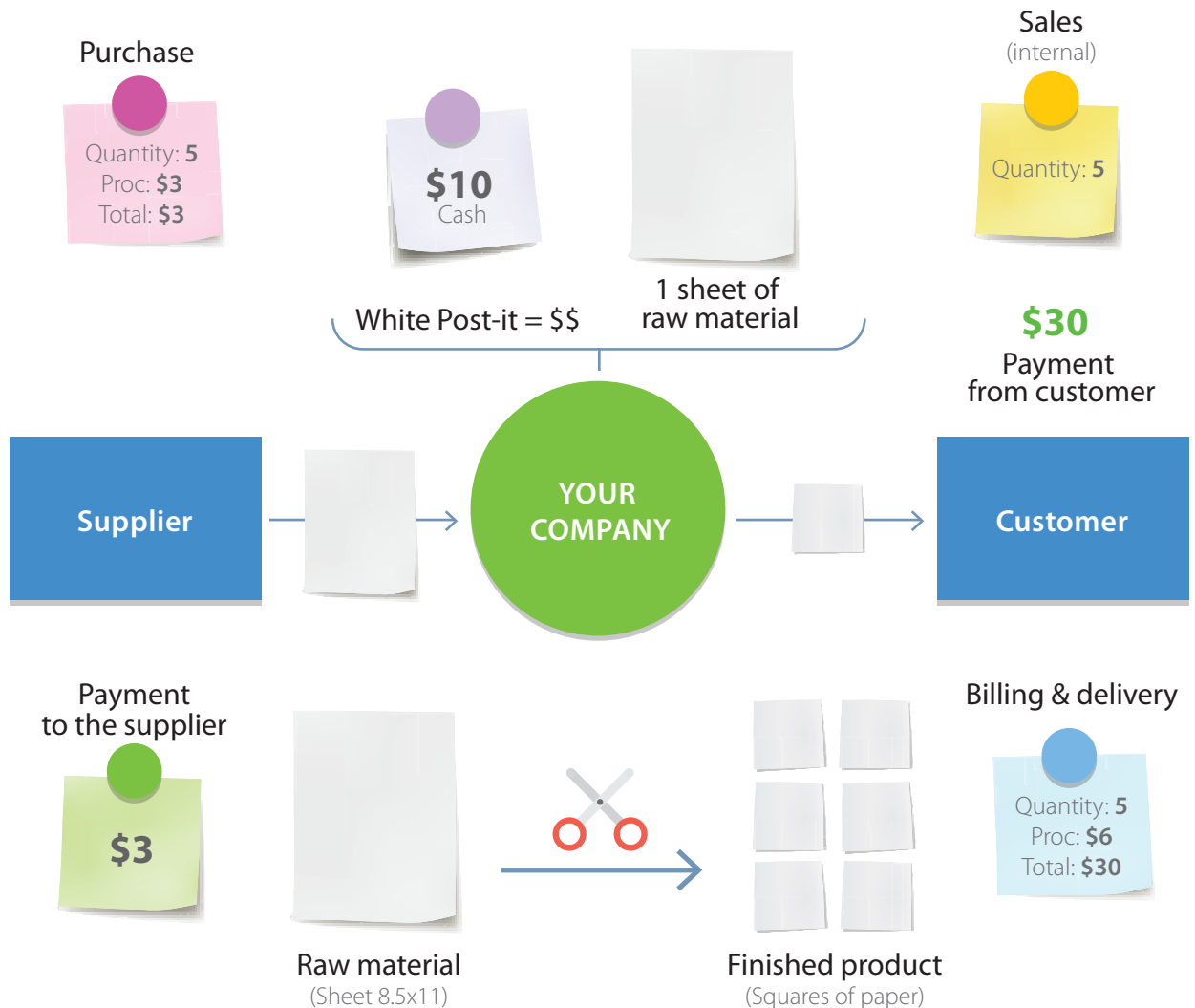


Figure 6: The Paper Game Supply Chain

The instructor plays the role of both client and supplier. For large groups, a teaching assistant can be used to help manage the two roles.

Playing the Game

Introduction (10-15 minutes)

The game should be introduced in less than 10 minutes. A PowerPoint slideshow outlining gameplay is available at the following address : https://ersim.hec.ca/learning/games/paper_game

At this stage, it is necessary to explain the following:

- Teams have 10 minutes to set up their operation and decide how to organize themselves.
- The game lasts approximately 30 to 45 minutes.
- The simulation consists of 10 rounds lasting from 2 to 5 minutes each.
- A 10 minute break takes place at the half-way point to allow teams to reorganize.

Each team begins with a cheque for \$10 on a white Post-It note, and a sheet of raw material.

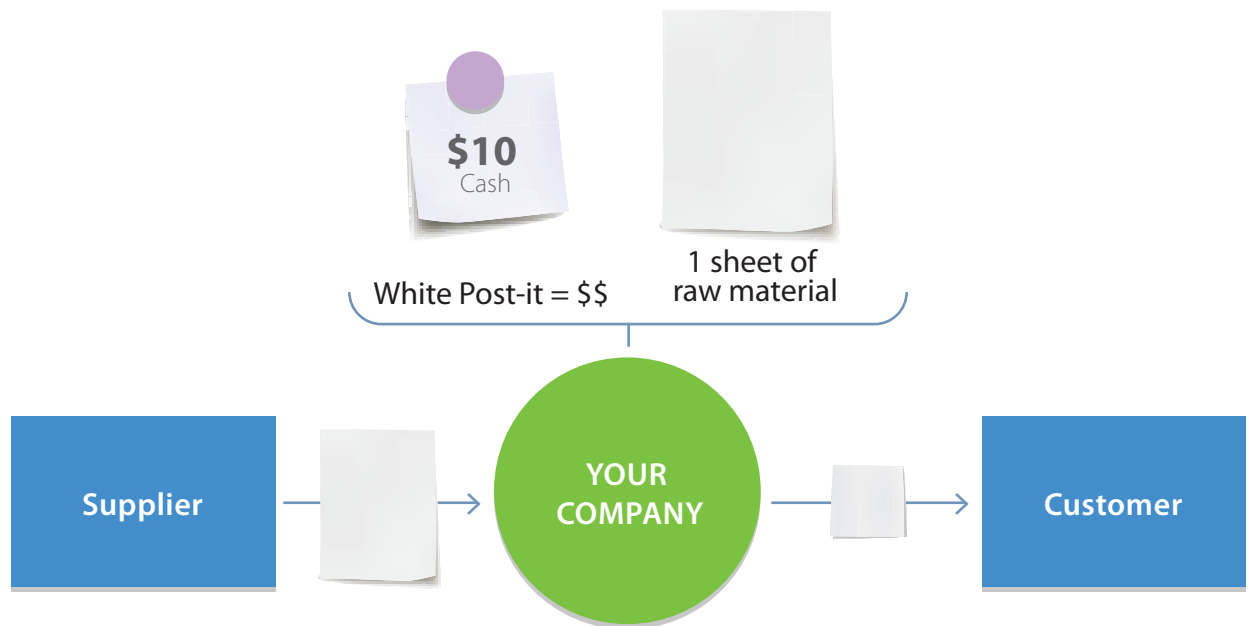


Figure 7: Starting the Game

At the start of each round, the instructor rolls two Market dice. The sum of the two dice represents the price customers are willing to pay, so the price should be between 2 and 12.

Each team is free to sell as many pieces of paper as they have finished product in stock. At the start of the game, teams can only sell up to 6 squares each, given their initial inventory.

Should a team decide to sell, a student is responsible for delivering the pieces of paper sold (which can be put into a recycling bin in the centre of the classroom after the amount has been verified). The student must also bring a blue Post-it note displaying the quantity sold, the selling price and the amount to be paid. In other words, this is the invoice. The term of payment from the customer is 2 rounds. The student places the invoice in the instructor's supplier account matrix during T+2. A student must return 2 turns later to collect payment from the instructor on a white Post-it note (Client Cheque).

Équipe / Team	T1	T2	T3
A	Qty = 5 Price = 6\$ Total = 18\$		
B			

Équipe / Team	T1	T2	T3
A			Team A 18\$
B			

Figure 8: Left: Delivery (blue post-it) at T-0, Right: Customer payment (white/purple post-it on blue post-it) at T+2

Then, the instructor rolls one die to determine the cost of buying paper sheets from the vendor. A student (Buyer) must indicate interest to buy by writing the desired quantity and the price on a pink Post-it note; this is a purchase order. Delivery will take place 1 round later. The student must place the pink Post-it in the purchasing matrix at T+1. Payment must be made during delivery; the student must write the purchase amount on a green Post-it note; the company cheque.

Équipe / Team	T1	T2	T3
A		Qty = 1 Cost = 2\$ Total = 2\$	
B			

Équipe / Team	T1	T2	T3	T4
A		TEAM = A Date = T2 Amount = 2\$		
B				

Figure 9: Left: Raw material purchase (pink post-it in T+1), Right: Receipt of goods and payment of T+1 purchase (pink post-it on pink post-it) at T+1 with delivery

At the end of the round, the instructors ask teams to report some accounting information, such as the current profit.

Before Starting the Simulation (10 minutes)

It is important to give students time to think about organizing the work. They must determine the roles each student will play, and establish internal management. There should be a student responsible for selling the squares of paper, a student responsible for buying raw materials, a student in charge of production and a student in charge of accounting.

The use of a computer or calculator is prohibited, so it is important to use the 2 sheets of light-coloured paper to establish a method for documenting needed information. These are the repositories of information in the business process. For example, teams could decide to make a financial ledger and an inventory record. Let the students think what should be the structure of those documents. Don't tell them what to do; let them think what is the best way to structure the company.

Gameplay (30 to 45 minutes)

Figure 10 presents what takes place during a game turn. The PowerPoint slides provides this figure for every round of the game



Figure 10: Gameplay

Before the round begins, the instructor posts on the customer matrix the white Post-it to pay for any outstanding payable.

Client / Customer							
Équipe / Team	T1	T2	T3	T4	T5	T6	T7
A			Team A 18.5				
B							

Figure 11: Customer payment.

Here is what takes place during a game turn.

Step 1

- The instructor rolls the two 6-sided Market dice and announces the sales price (the price the customers are willing to pay).
- Students decide if they want to sell.
- A student delivers to the recycling bin and posts the invoice (blue Post-it note) in the customer matrix during T+2 (this is posted to the right of the board).
- If a customer payment is due during the turn, the student collects the payment (white Post-it note) found in the matrix.

Step 2

- The instructor rolls the one die for Cost and announces the cost of buying new raw material (sheet of paper).
- Students decide if they want to buy. Teams are limited to buying 2 pieces of paper per turn.
- If they choose to buy, a student from the team must place a pink Post-it note (Purchase Order) in the supplier matrix during T+1.

Step 3

- If an order was placed during the previous round, a team member can also come to pick the raw material (white papers). To do this, the team must have placed an order during T-1. A pink Post-it note will be put out during the current turn if the team placed an order. To collect materials, the student must have a green Post-it note (i.e. a company check) indicating the amount owed to the supplier.
- After receiving the goods, the student can begin cutting the paper into finished product.

In summary, Post-it notes represent the following:

- Blue Post-it Note – \$\$ owed by the customer, and the requested product quantity
- Pink Post-it Note – quantity of raw materials to order
- Green Post-it Note – \$\$ owed to the supplier

After a few rounds, students should be able to answer the following questions about the business process:

- What is your profit at the end of round 5?
- How much product do you currently have in stock?
- How much do you owe to your supplier?
- How much do your customers owe your company?

Before continuing with the second half of the game, tell students to take a moment to reflect and review their business process. Also, let them know that from this point forward, they can

only communicate with one another through business documents. In other words, it is no longer possible to speak or gesture to colleagues! Orange Post-it notes will thus become very useful. Give 10 minutes to the students to discuss how they should organize their internal business process for this new challenge.

During turns 9 and 10, it will not be possible to purchase raw materials.

- What is your profit at the end of round 10?
- How much product do you currently have in stock?
- How much do you owe to your supplier?
- How much do your customers owe your company?

You could declare at this point a winning team based on the profit realized in the game. Obviously, competitive nature of the game creates engagement on the students' side but it does not have implications for the pedagogical objective. Whether or not they have won or lost the game, each student team will have experienced the information flow required to support the business process of the company.

The Post-Mortem (15-25 minutes)

In order to prepare the post-mortem, each team must draw the work organization within the team. Ask teams use stick figures and arrows to illustrate the flow of the information between team members. There should be a stick figure for every player in the team. Ask student to put post-it with the right colors on every arrow to illustrate how this flow was handle during the game. If you see an arrow without a post-it, ask the students how was the information transmitted during the game. Make sure that the light color sheets are also represented in the model. They should indicate with arrows who was adding information to these information repositories (write) and who was only consulting them (read).

In my experience, this should take 10 to 15 minutes to complete. After the work is completed, choose a few teams to present the result to their peers. While a student presents his work, make sure to have them clarify the vocabulary used to describe the business process. For example, a student could say "I was using a pink post-it to buy material". You could correct him by staying "You were sending the vendor a purchase order to replenish our raw material". At the end, you should have reviewed the most important business document such as the sales order, the invoice, the payment, the purchase order, etc.

One thing that is worth noticing is the variance across teams with regards to their business process. Interestingly, despite the simplicity of the task, every team seems to organically create a business process that is different from the other teams. It can be interesting to draw the students' attention to this variance to show that every business is likely to operate differently.

Here are some examples of business process models from my experience with this paper simulation:



Here are a few additional questions that you may ask during the post-mortem.

- What were the activities that created real value for your customer?
- What was the percentage of time that your team has devoted to cutting paper?
- What else were you doing?
- What were your decision rules?
- Were you more efficient when you were not allowed to talk? If so, why?
- Were you able to track profits accurately?

Conclusion

As previously mentioned in the introduction, the simulation is quite effective in having students develop a hands-on understanding of the information that is needed to support even a very simple business process. When being asked to reflect on the proportion of time spent to create value for the customer, the students realize how much effort was required to keep up with the information flow. The transition from the simulation to the ERPsim game seems natural for the participant. Interestingly, students often come back to the paper game in the class discussion to illustrate the impact that information technology has even on small organization.

Appendix 1

Sales

Team: **B**
Date: **T**
Quantity: **5**
Price: **\$2**

Shipping

Team: **B**
Date: **T**
Quantity: **5**
Price: **\$2**
Total: **\$10**

Payment from customer

TO: **B**
Date: **T+2**
Amount: **\$10**

Procurement

Team: **B**
Date: **T**
Quantity: **1**
Price: **\$4**
Total: **\$4**

Payment to supplier

From: **B**
Date: **T+1**
Amount: **\$10**