INTOPIA

Strategic Management Simulation
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A Variation on the INTOPIA Model
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Overview

The INTOPIA simulation was developed in the early 1900s as the first strategic management simulation oriented towards the problems of international trade and overseas operations. It is typically used in the capstone course of a graduate or undergraduate business program. The simulation is designed to provide general management training as well as balance decision-making in all the classic functional areas of finance, marketing, research and development, information systems, operations, human resources, and organizational behaviour.

INTOPIA is most practical for between 10 and 60 company teams, each comprised of between 3 and 6 executives. The organization of each company may vary according to orientation (e.g., by product, function, geographic area, or customer groups). As a general rule, the participating companies have overlapping, somewhat divergent strategies, and rarely the same objectives. Each company is faced with an ongoing flow of marketing opportunities. A realistic division of labour occurs within the marketplace – in this case, between component manufacturers, finished goods manufacturers, and wholesalers.

There are a variety of different scenarios available for this simulation; however, the majority of these scenarios center around two products. One product (i.e., product X) is a component product – i.e., a necessary part of another finished good. For example, laptop computers may have the following component parts – chips, screens, keyboards, etc. The other product (i.e., product Y) is the finished good (e.g., a laptop). The finished good contains some product X (i.e., components) plus additional enhancements in production to transform it into a finished good available for sale to consumer markets. Some examples of these scenarios involving components (X) and Finished Goods (Y) include: chips(X) and PCs(Y); wheels (X) and rollerblades (Y); Batteries (X) and Smartphones (Y); hockey blades (X) and hockey sticks (Y); crude oil (X) and refined oil (Y); and cannabis plants (X) and cannabis-based oil products (Y).

The simulation allows for substantial freedom of inter-company transactions and negotiations. Companies may borrow, lend, buy, sell, license patents, participate in joint ventures, trade information, and participate in long-term partnerships. A major function of this game is the building and maintenance of social networks – including information networks, channel systems, and research and development alliances.

Companies operate in one, two, or three marketing areas determined by the game coordinator. These areas may be different regions within a single country or different countries/continents. Each area will differ in terms of market size, demand, and manufacturing functions. It will also differ in degrees of currency, economic development, rates of growth, and business cycles. In some games, each area will share the same currency (e.g., CAN dollar).

Each team competing in the game will have a home office. This home office is separate from the marketing areas and contains the general management, marketing research, and the research and development functions for the entire company.

How it Works

Teams of students compete against each other in this simulation. At the beginning of the simulation, students register their team on the simulation website. The decision program application on the website contains all of the decision forms that allow the students to specify their decisions for a particular period.

The game administrator has a master program that collects the decisions from each team. Once all teams have submitted their decisions, the administrator launches the master program which processes all decision forms thereby transferring monies, manufacturing products, selling products, shipping products, etc. The master program generates output for each team that details the results of each team's decisions in terms of sales, profitability, etc. The game usually continues for between 8 and 15 decision periods; although, in theory the game could continue indefinitely.

The last decision of your game is an important one. You should never treat the last decision as if your company is folding; it should be treated as a going concern. Therefore, you should continue to produce, purchase, do research and development, and negotiate contracts. Your performance will also be judged based on "future considerations". In other words, the evaluation of your team's performance will be partially based on the administrator's assessment of how your team might have done had the simulation continued indefinitely.

There are several "virtual" items in this game of which you have little to no control.

1. The administrator – always runs company 99 and sometimes runs Company 1 (which will also compete in the market). The administrator is also the government, the patent office, the consulting office, and the central bank.
2. Area warehouses – everybody has one of these regardless of whether or not you are producing or selling in that area. You are only charged for it, when it contains inventory (this is reflected in warehousing costs). Finished product always goes there first.
3. The consumers – the simulation controls the consumers – their preferences, their number, etc.
4. The shipping companies – the simulation controls the airplanes and the trucks – all you have to do is fill out the right form and the virtual trucking company or the virtual airline will take over.
5. Manufacturing agents – this is one of the possible channels. If you sell product directly to the end consumer without sales offices in the area, these virtual agents will go to work for you for a commission. There are an unlimited number of virtual manufacturing agents in each region.

A General Model of INTOPIA

The scope of operations in INTOPIA can be identified in terms of a company's product (service) offered, its clients, the territory cultivated, and the functions (e.g., marketing, manufacturing) performed. Deciding the scope of the business (i.e., what business the company is in) is often the most difficult step of the management in this game.

There are a number of entrepreneurial opportunities in this game as outlined in the table below. The number of options is increased by the fact that any kind of combination is possible (e.g., a company may carry on financial services and R&D from their Home Office while being an integrated manufacturer-marketer in one or several areas).

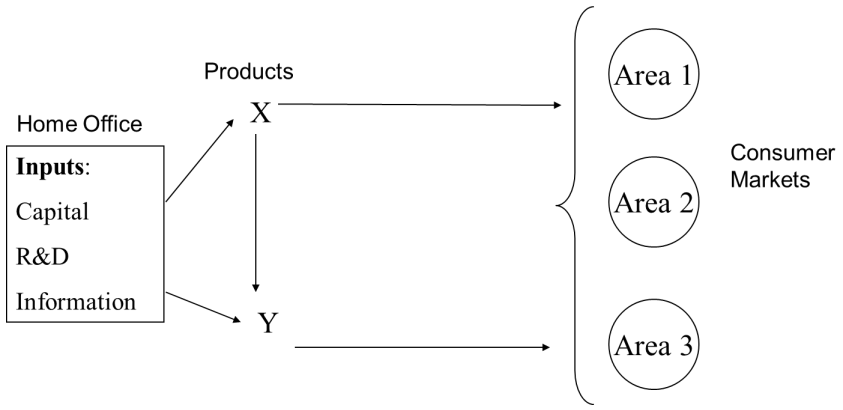
Area of Opportunity	Dimensions
Product	Product X - Grades 0 through 9. Product Y - Grades 0 through 9. Grades represent product improvements.
Functions Performed	Manufacturer, distributor, specialty wholesaler, integrated producer, marketer, subcontractor, financial services, research institution
Clientele	End consumers and resellers, wholesalers/distributors, Product Y manufacturers
Area	3 Operating Areas plus 1 Home Office Area (note: no sales, or production in the home office area)
Time	Operations in one area (or product) may begin in one period, operations in another area (product) in another period

When trying to decide what business to be in, try and look for competitive advantage (e.g., advantage in terms of low cost, large market, first-mover advantage, patent position, or economies of scale). The INTOPIA simulation is not a zero-sum game. In other words, it is possible for all of the companies in the game to be profitable depending on how resources are allocated over the span of the game. With that in mind, it is important to remember the 3 Cs of Relationships and Networks.

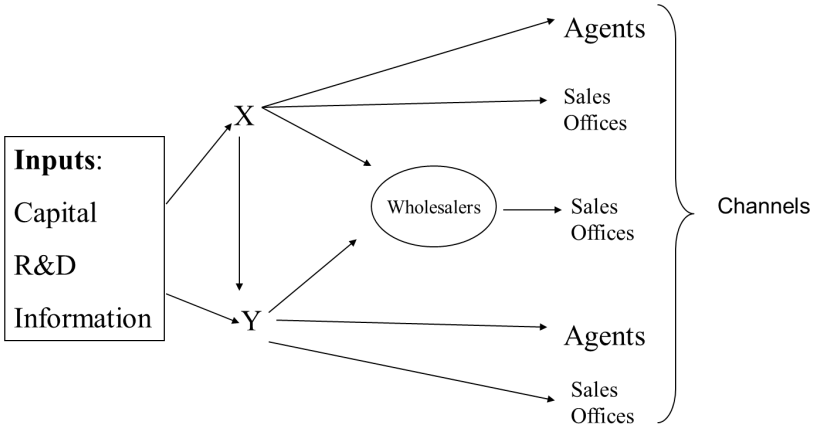
> Competition: behavior that is goal-centered based on scarcity, indirect, and impersonal, in which a third party controls the goal or object.
>
> Conflict: behavior that is opponent-centered, very direct, and highly personal, in which the goal or object is controlled by the opponent.

Cooperation: behavior that involves joint striving for a goal or object, is direct or indirect (implicit or explicit), and personal, in which the goal or object that is controlled by a third party can only be secured if the focal parties coalesce.

In INTOPIA, competition and cooperation are good and expected – conflict is not!



The model above depicts the general flow of goods and other capital in INTOPIA. Each company will start with a fixed amount of equity (and subsequent cash) in the home office. Companies can transfer these funds to operating areas to purchase factories, begin manufacturing, and/or purchase inventory. The two central products (X and Y) are manufactured in separate factories/plants in any of the three operating areas. X and Y cannot



be manufactured in the Home Office. To manufacture Y, a supply of X cards is required – X card is a component of the Finished Good Y (e.g., Battery + Phone = Smartphone). A Y manufacturer can obtain X by producing it itself, or by purchasing it from another company (i.e., X manufacturer or wholesaler). The finished products can be sold to the end consumer through manufacturing agents, sales offices, or a combination of wholesalers and sales offices.

The market for components (i.e., Product X) consists of both Y producers and individual consumers. There is also an end-consumer market for the component products. In some cases, the component products may be more profitable (e.g., blades and razors) than the finished goods.

The Operation of the Simulation

Each company decides on its own internal organization. For each decision, the team will complete a number of decision forms that allow the firm to manipulate specific variables (e.g., set prices, manufacture products, transfer money to an area). For each decision period, the team will submit the decisions via the website. Once all teams' decisions are received by the administrator, the decisions are inputted into the master program. The master program collects all decision forms, generates consumer sales based on the parameters set for each area, and produces output for each company. The output is excel-based and has 3 sheets. It contains: a balance sheet, an income statement, and a production report. There are eight or nine decision periods for a typical INTOPIA run – these can be thought of as individual operating years.

For each simulation scenario, there are the following resources:

- a document that outlines the specific details of the industry that is simulated (e.g., smartphones, computers, oil, hockey equipment)
- a DATALOG that outlines the beginning values of important variables (e.g., tax rates, consumer prices for standard products, estimated manufacturing costs, plant construction costs)
- a manual that describes the operation of the decision program

The Decision Program

Decisions are made on the INTOPIA website. Once a team is registered, they will be able to login to the decision portion of the website. On the website, they will login as a specific team number (e.g., Team 3). The team will then make a series of decisions for a specific period (e.g., Period 2). These decisions might include such things as building plants, transferring money to an area, producing a product, setting a price, selling to another team, or spending money on Research and Development.

Sending Decisions to the Administrator

Once a team has submitted all of its decisions for a particular period, it will return to the home decision screen, review all of its decisions, and then verify them. Once a team has verified its decisions they can be collected by the administrator for processing. Decisions can be unverified and/or re-verified up to the decision deadline. At the deadline, the administrator will no longer accept decisions for that period.

Products

The INTOPIA simulation consists of two consumer products. Each company begins the simulation with the ability to produce the initial grades (levels) of products X and Y (i.e., X0 and Y0). For higher levels of Product Y, a higher level of Product X may be required (e.g., an X2 may be required to produce a Y2 – see the DATALOG for an X-Y conversion chart that outlines compatibility). Higher grades of both products are likely to command higher prices, and likely cost more to produce.

Product X can be sold "as is" to the end consumer or used in subsequent manufacturing of Product Y. The component may or may not have several levels of product improvements that will be determined by the coordinator. With each grade increment, the value and capabilities of the component should increase. Similar to Product X, Product Y may also have levels of improvement. With each level of improvement increment, Product Y's value to the consumer may also increase.

Product Improvements – Research and Development

To produce higher grades of each product, a firm must obtain a patent. A patent may be obtained in one of two ways:

1) by investing in research and development; or
2) purchasing the license for a patent from another firm.

Patents for higher grades (e.g., X1, X2, Y1, Y2) can be held by a multitude of firms – i.e., there is no exclusivity on patents.

Research and Development

To invest in Research and Development, a firm dedicates some cash to R&D activities in the home office. R&D is invested in each product separately. The cash is used to pay for scientists to work on developing the next level of technology. The more cash devoted to R&D, the higher the probability that the investing firm will reach the next level of Product X or Y. There is, however, a limit to how much R&D expense is useful. Early patents typically cost less than later patents. The amount to obtain a patent increases with each grade level; however, R&D expenses of more a certain amount may be considered wasteful. Additional expenses simply add more scientists to the task of obtaining the patent. In keeping with the "too-many-cooks-spoil-the-broth" philosophy, returns to R&D expenses are diminishing. Patents are granted at the end of the period and appear in the team's information systems output.

There is a small amount of luck involved in the development of patents – for example, two firms may invest identical amounts of money in research toward X2. One firm may be successful, while the other is not, representing a possible difference in the quality of the two firms' scientists. If a firm is unsuccessful in obtaining a patent, it retains the knowledge in which it has invested. In other words, further investment will continue to add

to the probability of reaching the patent level, making its eventual attainment more likely. Once a patent level has been reached, the probability for that team is set to zero, and research and development must begin anew in the next period. Teams can never skip grades in R&D.

If a team decides that it is going to do Research and Development, it should plan accordingly.
The simulation program rewards teams (through patents) that maintain consistent levels of Research and Development Activity. Teams that do not invest in R&D one period may be unsuccessful in the next period since it is assumed that they would have to rehire scientists.

R&D Specialist:
A Research and Development Specialist firm dedicates all of its resources and activities towards the development and subsequent licensing of higher grades of products. These firms, when registered, have a distinct advantage in the research and development function. Presumably, their specialization has resulted in better scientists able to achieve innovation more readily than those firms that are not R&D Specialists. An R&D specialist will do research and development on both products (X and Y) throughout the game. The R&D specialist must spend a minimum of 35% of its total R&D spend on one product or the other (e.g., X: 65%; Y: 35%). Also, an R&D specialist must operate one X plant and one Y plant in one area of their choice for the purposes of testing their new grades. A registered R&D specialist may only operate those two plants.

Licensing

Teams that invest in Research and Development can license other firms for the ability to produce a particular grade. A license always takes one period to take effect. So if Team A fills out a license form for Team B in Period 3, Team B may begin manufacturing of that licensed grade in Period 4 only. **Note: neither a license, nor a patent is required to sell products – a wholesaler need not be licensed to sell a grade, they can just purchase it from firms that have the patent.** Licensees are essentially given the patent. The licensee may produce the grade licensed, may license it to another party, and its future R&D will be directed toward the next highest grade (i.e., if given a license for X_2, future R&D will be directed towards attaining X_3). Licenses are sold for lump-sum payments only. The table below outlines timing issues associated with licenses.

	Period t	**Period t+1**	**Period t+2**
R&D firm	Does Research and development – receives patent at end of period	Fills out license form Produces new grade in their own plants.	

Licensee		Pays for license	Can produce on license or resell license if permitted by licensor

Manufacturing

Companies may open up to three factories per product, per area (a total of 18 possible factories = 3 X factories in each area, 3 Y factories in each area). The capacity of factories differs according to the geographic area (see DATALOG for factory capacities). While companies may manufacture up to the maximum capacity in each factory, the optimum capacity (i.e., the capacity that results in the lowest variable cost) is usually somewhat less than the maximum. Factory acquisition costs, depreciation rates, and fixed costs for factories are outlined in the DATALOG. Factories are fully paid for when ordered by case in the area, and fixed costs and depreciation take effect when the factory is "on stream" (i.e., able to produce). Fixed costs are paid out of cash in the period in which they occur.

There are some timing considerations with respect to manufacturing. **For Y plants, F**actory construction always takes one period. For X plants, factor construction takes ½ a period – in other words, production capacity is 50% in the period in which it is built.**

For both plants, manufacturing always takes one period. Manufacturing during a period always goes to finished goods inventory. It cannot be sold, shipped, or used in manufacturing of Y (if X) until the subsequent period. Therefore, the earliest period in goods can be available for sale is in period two for Product X and period 3 for Product Y following the schedule below.

Period 1:	Construction of X Factory and production of 50% capacity of X, Construction of Y Factory
Period 2:	Manufacturing of Y using period 1's production of X, Further manufacturing of X, consumer sales of X (if leftover)
Period 3:	Consumer sales of Some X & Y, Manufacturing of Y using leftover X
Period 4:	Consumer sales of Product Y

If a company buys a factory from another company, the factory is immediately ready for manufacturing (i.e., "on stream"). Inventory is never included with a factory sale, this needs to be done as a separate transaction (i.e., with a separate decision form).

Variable costs of X and Y vary depending on location. Estimates of these initial costs are provided in the DATALOG. Manufacturing costs will generally increase as the grade manufactured increases. Variable costs of manufacturing will vary greatly according to the amount produced, the age of the factory, the amount spent on methods of improvement each period, experience with manufacturing, and the grade of the product manufactured. Variable costs tend to increase as factories become older. Variable costs are paid according to the accounts payable terms of each area – i.e., a portion of the variable costs are paid in cash; the remaining portions are accounted for in accounts payable (see the DATALOG for A/P terms for each area). Companies are well-advised to consult the various market research items available for indications of future manufacturing costs.

When goods are produced, they are placed in inventory to be ready for sale in the next period. Companies may hold only two grades of each product in inventory in each area. For simplicity, these appear on the output as **Standard** grades and **Deluxe** grades. These labels are somewhat arbitrary – i.e., the consumer recognizes the grade level (0-9) and its designation as standard or deluxe. For example, if you have only one grade in inventory (even if it's grade 8), it is your standard grade. It is important to manage inventory levels properly. If it should happen that a third grade arrives in inventory, all of the inventory at the medium grade will be downgraded to the standard grade.

Both Standard and Deluxe grades may be produced in the same factory during the same period; however, this will result in additional expenses associated with changing over manufacturing processes to produce a different grade.

Manufacturing of product Y requires an inventory of product X available at the beginning of the period. Product X will be available if it was manufactured by the company in the previous period, was shipped by surface freight to the firm by another company in the previous period, or if it is air shipped to the firm in the current period. In the manufacturing of Y, the use of X will default to the standard grade unless an explicit decision is made in the period (using the manufacturing priorities on the manufacturing decision forms). In some cases, it may be advantageous to use a higher grade of X in manufacturing of Y (e.g., if the higher grade of X is less marketable to the end consumer than the lower grade).

Methods Improvement

Variable costs of production can be reduced by investing in methods of improvement. The Datalog contains an estimate of the minimum amount of spending that must be done in methods improvement in order to reduce variable costs. Methods improvement expenses apply to the area in which they are invested – e.g., expenses in Area 1 apply to all plants in area 1 only. Methods improvement can be considered to include such items as training, equipment maintenance and repair, and equipment replacement.

Logistics (Shipping)

There are two modes of shipping product available in the INTOPIA Simulation. Typically, these are by air (i.e., fast and expensive) or by surface (i.e., slower and cheaper); however, these methods may vary according to the scenario. For example, for the oil industry the shipping methods are by pipeline (faster and more expensive) or by tanker (slower and cheaper).

Marketing

Consumer Sales - Pricing and Selling

There are only two conditions that need to be met to sell product to the end consumer. First, the company must have an available supply of inventory; either manufactured in that area in the previous period, shipped via surface freight in the previous period; or shipped via area freight in the current period. Second, the company must set a price for the product. When setting prices, companies should be cognizant of whether the product in inventory is the company's standard grade or deluxe grade. Always refer to your ending inventory from the previous period to set prices. Prices need to be set each period (e.g., a price set in period 3 does not carryover to period 4).

Note: you do not need to have the patent for a particular grade to sell that grade on the market. Patents are only necessary when producing.

Marketing decisions in INTOPIA follow the usual 4 Ps found in any marketing program. Product decisions include the decision to carry **Standard** and/or **Deluxe grades** within each area. Remember, however, that consumers purchase based on the grade number, not the standard or deluxe label. Making two grades (i.e., standard and deluxe) available for sale to consumers is good practice and is usually well received by consumers and reflected in better sales.

Prices can be set for both Standard and Deluxe grades each period. Marketing research provides companies with prices that the competition set in the previous period. Companies can usually expect that a higher grade of product will command a higher price. Companies should expect there to be some introductory problems when entering a consumer market for the first time. Remember to price according to what is in your inventory (standard and deluxe). If it appears that the system did not use the price you set (i.e., it appears as 0 in the market research item pertaining to prices), it is because you had no inventory available for sale.

Promotions

Promotion is handled in a number of ways. First, advertising expenses in various media may be entered into the marketing decision form. This advertising expense is aimed at the end consumer in the area in which it occurs and only for the product advertised. There is no spillover effect of advertising from product X to product Y; however, the effects of

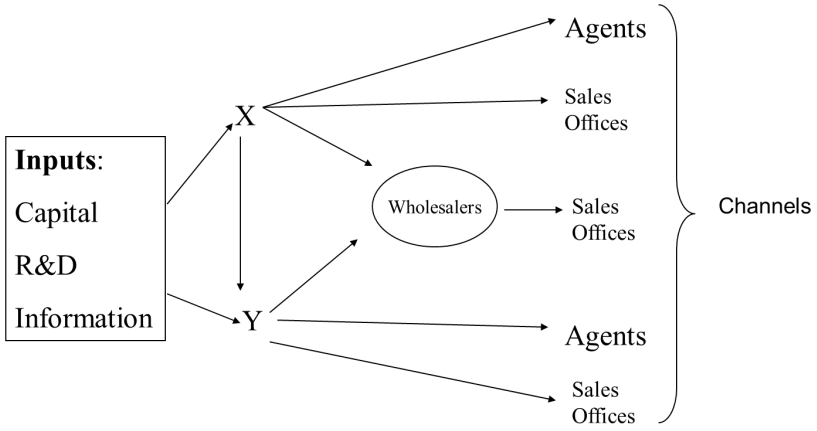
advertising will carryover for a number of periods. The minimum amount of effective advertising expense differs according to the area in which it occurs. Generally, more money dedicated to advertising increases the GRPs (gross rating points) per period.

Channels

There are three channels of distribution available to each company that wishes to sell product to the end consumer.

First, companies can sell directly to the end consumer by posting a price. Manufacturing agents (these are virtual) will automatically sell product for the company to the end consumer for a commission per unit (see DATALOG). There is an unlimited number of manufacturing agents available in the game and the number of products sold will depend only on the market demand. Manufacturing agents are paid a straight commission on each unit sold.

Second, companies can open sales offices in the area. There is a cost to open or close each sales office that is provided in the DATALOG. The sales office takes one period in which



to be open, at which time companies begin to incur a fixed fee per period per office along with a commission per unit for each product sold. The first sales office that a company opens is the central office for use in this area and is three times the per-period cost of a regular sales office. A company may open up to nine offices (including the central office) in an area. Sales offices are not owned, they are leased.

Sales offices handle both products, X and Y and the commission varies according to whether the products are sold in isolation (e.g., Y only) or combined (e.g., both X and Y = combined is cheaper). The commission for a sales office is lower than that of a manufacturing agent; however, there is also a fixed fee per sales office per period (e.g., leasing costs). This requires some optimization of the selling feature – i.e., at a specific quantity of X and Y, using sales offices becomes cheaper for the company.

Third, a company may wish to take advantage of a wholesaler. Wholesalers are other teams in the game that elect to follow this business model. Wholesalers must have a minimum of

three sales offices in the area in which they are a wholesaler. They are more effective at end-consumer sales to the tune of about 20 percent, than non-wholesalers (i.e., they have a stronger brand). Also, wholesalers pay lower inventory carrying costs, thus can afford to stock more product. A wholesaler is generally an area specialist that has no factories in the area and gets at least 50 percent of its supplies in the area under contracts with other companies in INTOPIA. Wholesalers must register in the decision program and maintain their registration in order to receive the benefits of lower inventory costs and greater marketing effectiveness. There is generally a one-time fee for registering as a wholesaler.

Companies that stock out of product in a given period are likely to suffer customer goodwill loss which will negatively impact sales (by about 5-10 percent) in the following period. Wholesalers will suffer significantly less goodwill loss in the event of stock out.

Marketing Research and Industry Information

There is a wealth of marketing research items available for order. During each decision period, companies can order market research items to assist with decision-making in the subsequent period. There may be some research items that are provided freely each period.

The administrator usually issues some INDUSTRY NEWS before each period's decisions. It is provided in the Industry News and Indicators area of market research. A regular feature of this item is a discussion of the business climate in the three regions, forecasted exchange rates, and prediction of economic indicators, industry gossip, technology updates, labour conditions, and upcoming events.

B2B Sales - Shipping and other Transfer Costs

Companies engaging in inter-company sales (selling products to another company) or intracompany sales (selling products to another area within their company) can choose between two transportation modes: surface freight and airfreight**. Note that there are no shipping or transfer costs in component sales (i.e., sales of Product X to Y factories in the same area).** Companies wishing to use product X from their X factories to manufacture Y in the same area need not complete any forms – the components will automatically be taken from inventory in the area. Should companies wish to produce Y using X from another area, it must be shipped to that area (use the intercompany sales form and sell the product to the area with the Y factory).

Shipping or transfer costs include transport, tariffs, documentation, etc. customarily involved in shipping goods. The shipping company always pays transfer costs. The base transfer costs for both shipping modes appear in the DATALOG. There are discounts for larger volumes of goods between areas.

Surface transport from one area to another, or between different companies in the same area, requires one period in time. In the period of shipment, the product is shipped from the seller's inventory to the buyer's inventory. Such goods can only be resold or used in the following period. Goods shipped via airfreight arrive in the buyer's inventory at the

beginning of the period of shipment. This permits the buyer to dispose of the goods in the same period. The buyer may immediately post a price for these goods, use them in further manufacturing, or ship them via surface freight to another company or another area. **Note: back-to-back air shipments of the same lot of inventory are not permitted**. For example, if company A receives 40,000 units of X3 by airfreight in period 4, they cannot ship that same 40,000 units by air to another company or another region in period 4. The can, however, ship those units by surface. Airfreight, as a mode of transportation, is noticeably more expensive per unit than surface freight.

Note: A company can NEVER produce and ship the same inventory in the same period

Transfer Pricing

It is not necessary to set transfer prices when using X in your Y plants within the same area. However, when sending X from one area to another (using the intercompany sales sheet), you are required to set a transfer price (i.e., you can't sell it to yourself for $0). You must set a transfer price of at least the average inventory value in this case. The same rule holds if you are transferring either X or Y from one area to another for the purposes of consumer sales. Transfer prices need to be set higher than the cost of goods. Failure to do so artificially inflates revenues in one area and artificially deflates revenues in another. While this may have tax benefits to the firm, it is evading taxes in one of the areas and is against the law. This will be monitored closely by the administrator and teams not conforming to this rule (either through ignorance or cunning), will be fined.

Inventory Processing and Inter- and Intra-company Sales

Inventory is book-valued at average cost of manufacturing or purchase (or both). If a company is selling in the consumer markets and the intercompany markets, the intercompany sales take priority of removal of inventory. Intra-company sales from one area to another are also taken out of inventory before consumer sales. Component sales of SIM Cards (product X) will take priority over consumer sales of SIM Cards. Sales by air are made before any purchases by air.

If a firm engaged in intercompany selling does not have enough goods in stock to satisfy the contracted demand of the buying company, the goods will be shipped by the simulation's virtual company to meet the seller's obligations. There is a substantial sales expediting surcharge, paid by the seller, in this instance. As long as the form is filled out by the seller, the buyer is assured of the grade and quantity contracted for.

Order of events for inventory processing:

1. beginning inventory value
2. intercompany sales by air
3. intracompany sales by air*
4. intercompany purchases by air
5. intracompany purchases by air

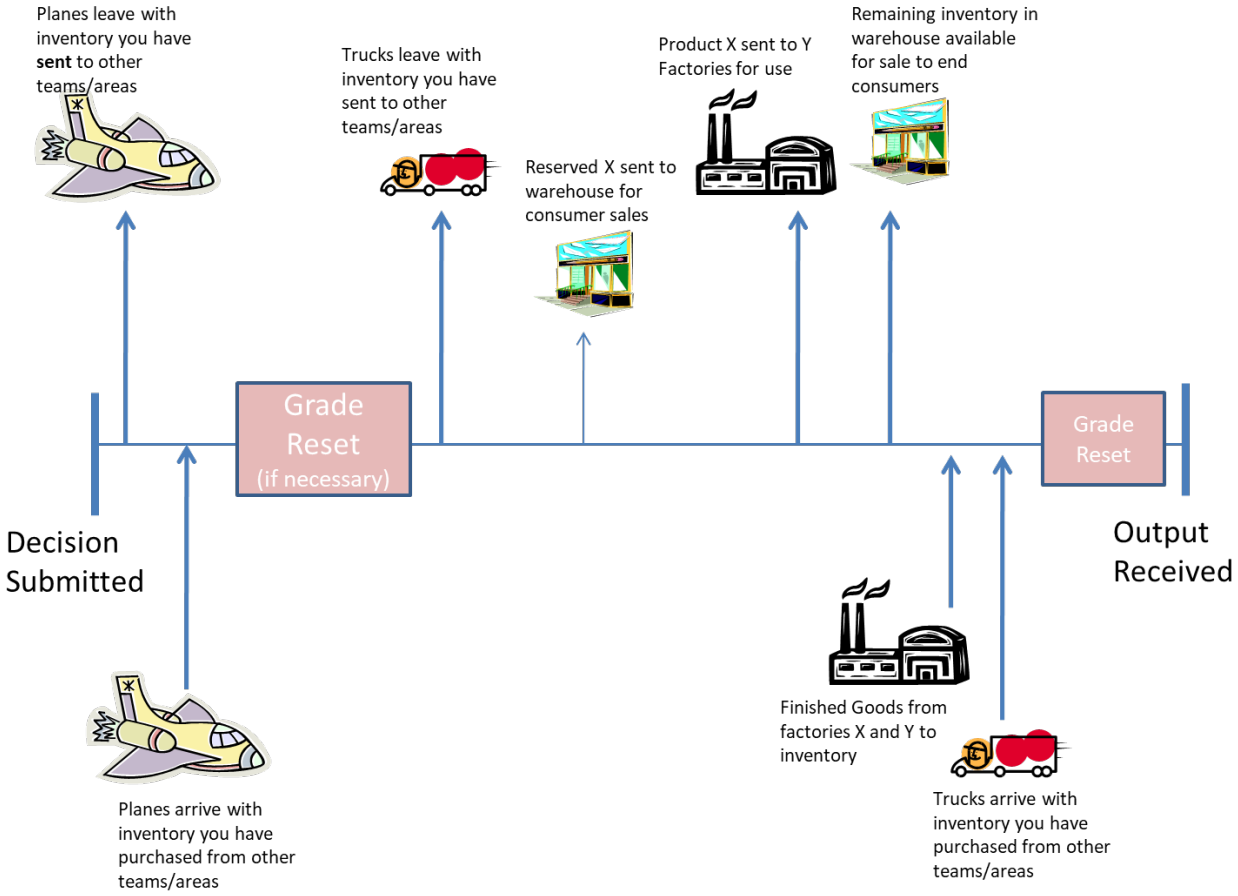
6. ***grade reset and intermediate average inventory value calculated here (<u>only</u> if required)***
7. intercompany surface sales
8. intracompany surface sales
9. reserve for consumer sales of X
10. product X to product Y work-in-progress inventory
11. consumer sales of X and Y
12. excess X to inventory
13. excess Y to inventory
14. Manufacturing of Y – cost of goods produced calculated
15. Manufacturing of X – cost of goods produced calculated
16. intercompany purchases by surface added to inventory
17. intracompany purchases by surface added to inventory
18. ***grades reset and ending average inventory calculated***

Note: Grades are only reset if products are RECEIVED by air and if it is required.

Some inventory scenarios:

1. *A company has X3 and X4 in inventory and receives X5 by air, its X4 will be downgraded to X3.*
2. *A company has X2 and X3 in inventory. It ships its X2 to another company by air and sets a standard price for X3. The company sells no standard product since X3 is in inventory as a Deluxe grade. The company suffers customer goodwill loss. The MR item for pricing shows that the company has set a price of 0.*

3. *A company has X2 and X3 in inventory. It ships its X2 to another company by air and sets a standard price for X3. The Company receives X4 by air from another company and sets both a standard price and a deluxe price. It sells X4 as its deluxe model and X3 as its standard.*



Sales Expediting Penalties

Sales expediting occurs in the game to ensure that B2B sales forms are honored. If a team completes an intercompany sale by completing the necessary form on the website, this sale is honored either by the selling team or the virtual team in the game (i.e., team 99). The virtual team will supply the product should the selling team not have the necessary quantity or grade in inventory. For example, if company A attempts to send 30,000 units of X3 (of which they have none) to company B, Company B will receive this inventory automatically from the expediting company (i.e., company 99). Company A will pay a base expediting fee plus an expediting surcharge. Normally this results in a loss to Company A.

In some cases, a company will attempt to send the wrong grade. For example, if company A sends 30,000 units of X3 (but they only have X2), Company B will receive the 30,000 units of X3. Company A's X2 units will be taken from their inventory and converted to

X3 (at an additional expense). Company A will pay both an expediting surcharge and a "reprocessing" charge.

Financial Management

Managing finances is perhaps the most difficult aspect of this game. With three operating areas, and Home Office, each team must effectively manage several different bank accounts (1 for each of the four areas x the number of currencies in the game – for a maximum of 16 bank accounts). The INTOPIA simulation is designed so that it can be run with four separate currencies.

The starting capital (defined by the game administrator) of each company is placed in the Home Office cash account. A corresponding amount is recorded in the company's common stock account. The number of common shares is not important, but if it makes you feel better you can think of the number of common shares being equal to the number of members on your team.

In order to begin operations in an area, the area must be supplied with some initial working capital (i.e., cash). This calls for an explicit decision. Cash is never automatically transferred to an area; you must do this by filling out the appropriate form (in this case, the finance forms). Area working capital can be increased by local profits, short-term borrowing, additional capital injections from home office, or by supplier credit. Line of Credit is essentially the plug on the balance sheet. It has high interest rates and should be avoided at all costs.

In some versions of the simulation, dividends may be paid to shareholders. Check with the administrator to see if this option is available.

Lines of Credit

The Line of Credit (LOC) is provided automatically when the balance of your area bank account is negative. The interest rate for the line of credit depends on the amount. Lines of credit that exceed are charged at an interest rate that escalates with the amount required. The line of credit is automatically paid in the following period before any other obligations are paid (assuming cash is available). The LOC account on the balance sheet includes both the principal of the LOC and its interest. Teams with excessive lines of credit may be forced to liquidate inventory in order to pay down their lines of credit.

Excessive amounts of Line of Credit will restrict teams from being able to purchase from other companies and will also reduce teams' abilities to produce at capacity. See the Datalog for the Line of Credit Limit for teams.

Loans

Bank loans of a long-term nature may be accessed for expansion of operations or for financial consolidation. The maximum amount obtainable, the interest rate, and the term are determined in each case by the Central Bank (the game administrator). Intercompany

loans may be negotiated at any time in any currency by any company from one or more companies. Principal and interest are always in the same currency. Standard loan contracts can be made by using the intercompany loans (regular) forms and these are automatically enforced, no periodic forms are required. These loans cannot be prepaid. Alternatively, teams are able to enter into custom financing arrangements by using the intercompany loans (custom) forms.

Types of Debt Financing Available in the INTOPIA Game

1. Line of Credit

The line of credit can be used when cash is unavailable in an area. The line of credit has no limit but the interest rate is high. The Line of Credit can be treated as negative cash in an area – it is paid back in subsequent periods when cash becomes available (e.g., from sales income or from capital transfers from other areas).

2. Area Bank Loans

Area bank loans are available in each of the operating areas for short-term financing needs. The interest rate is lower than that of the line of credit. Teams can request area bank loans directly on the website (approval is not required). The limit of the loan is a percentage (usually 60%) of the team's working capital (current assets less current liabilities) from the previous balance sheet. For example, a team requiring a short-term loan of $5,000,000 in period 4 would look at period 3's balance sheet in the area and calculate its working capital. Assuming that the limit is 60%, the team would require $8,333,333 in working capital in order to receive the full $5,000,000. The program will automatically reduce the amount of the loan to the limit. Area Bank Loans are paid back in cash the next period. The interest rate is reported in the datalog.

3. Loans from other Teams

Teams may receive loans from other teams. There are many different types of loans that can be negotiated between other teams in the game (see custom loans and standard loans). The interest rate and terms of the loans are negotiated between the teams and the administrator of the game is not involved. It is recommended that teams use a formal contract. No team may lend more than 25% of its total equity in the form of intercompany loans.

4. Loans from the Central Bank

The Central Bank will provide loans to teams during the game. Central Bank loans are always of a long-term nature (i.e., 10 periods or more) and are designed to fund long-term programs (e.g., new facilities, new business lines) rather than provide short-term financing or debt restructuring. The prime rate is published each period in the Industry Research data. The Central Bank will approve loans up to the cost of one additional factory (X or Y). Approval of such a loan will require a formal application that

includes projected statements. The interest rate will be determined by examining the team's financial history. Periods of unprofitability or a large amount of other debt (e.g., line of credit) will lead to a higher interest rate. Teams apply for central bank loans on the decision site allowing sufficient time for the administrator to review the loan (usually one hour before the decision deadline). Confirmation of the loan will be received by email.

The Central Bank opens in Period 4 and may close at any point during periods 5 through 9. Central bank closure may occur when it has been determined that the industry is carrying too much debt through formal lending arrangements and use of short-term instruments (e.g., line of credit, area bank loans, accounts payable).

Insurance

Insurance can be purchased for fixed assets (i.e., factories) and inventory within the decision program. This is located within the Special Services section. Fixed Asset insurance covers the team for losses to fixed assets such as fires, floods, terrorism, etc. Fixed Asset insurance will offer replacement value for the assets covered – for example, if a team loses a plant to fire worth $3,000,000 (net book value), insurance will pay for the replacement of that plant (cost of construction). Fixed Asset insurance does not cover lost profits or other opportunity costs that may occur due to the loss of the plant. Inventory costs are also not covered. Fixed asset insurance may be purchased for up to $99,999,000 worth of fixed assets. The premium is a reasonable percentage of the fixed assets insured (e.g., 1%). To make a claim, contact the administrator.

Insurance can also be purchased for inventory within the decision program. Teams enter the value of the book value of their inventory (currently in the warehouse) along with the book value of the inventory to be received that period by air from other teams. Inventory insurances covers replacement value of the inventory and not lost profits of other costs (e.g., contract breach fees) associated with the loss of the inventory. The premium is a reasonable percentage of the value of the inventory (e.g., 5%). To make a claim, contact the administrator.

Insurance purchase is a managerial choice, it is not mandatory.

Securities and Interest

Excess cash can and should be invested into securities in either the home office or the local area. Securities can be invested in either currency and may be recalled at any time without penalty. It is assumed that the portfolio of securities is re-analyzed every period; therefore, a formal decision to reinvest cash into securities is required each period. **Securities are essentially "cashed out" at the beginning of the next period.**

Positive currency balances are recognized by a modest interest payment.

Transferring Money

During the first three-four periods of the game, companies are continually sending capital (i.e., cash) to the three operating areas. During periods five and beyond, hopefully the operating areas will begin to be profitable at which point, it is desirable to send capital back to the home office. In a truly international game, this would be termed "repatriation" – i.e., sending capital home. With repatriation, you are essentially sending money back to the Head Office to pay back its initial investment in the operating areas. It may be helpful to think of the operating areas as individual subsidiaries in which the Home Office has invested.

Companies can send cash back to Home Office in a number of ways. First, they can return the initial investment (on Finance Form). This is a simple cash transaction affecting the balance sheet of the area and the Home Office. Amounts are deducted from the **cash** and **home office control** accounts in the area. Cash is added to the **cash** and **subsidiary control** accounts in Home Office. Second, firms can send back earnings (also on finance form). This process affects the retained earnings and cash accounts in both the subsidiary and the Home Office. Third, an area may make an internal service payment to the Home Office (on Form Service Payments) – presumably to pay for services such as market research, R&D, or other corporate overhead expenses. Companies are limited to 10 percent of the Home Office Account for internal service payments. Since this type of transfer is reflected in the miscellaneous income and miscellaneous expense accounts of both areas (subsidiary and home office), there are some tax benefits to sending cash to the Home Office in this manner.

Another reason to send capital back to Home Office, especially by repatriating earnings, is so that the company may pay dividends. Dividends can only be paid from the **Retained Earnings Account** of the Home Office, thus this account must have a positive balance. A steady stream of dividend payments will lead to stock market confidence. This confidence may lead to cash additions to working capital, reflected on the balance sheet as **paid-in capital.**

Short-term loans are available in each of the operating areas (see Finance Form). Loans are in local currency and are for one period only. Companies are restricted to a reasonable percentage (e.g., 60%) of working capital (current assets – current liabilities) at the beginning of the period in which the loan is sought. Any excessive loan decisions will be scaled down to the limit automatically. This is a reasonable alternative to using the line of credit.

Accounts receivable accumulate whenever consumer sales are made in any area. A certain amount of these sales are paid in cash immediately. A/R terms for each area at the beginning of the simulation appear in the DATALOG. Payment terms for intercompany product exchanges can be negotiated between companies; however, in the absence of any explicit decision to change the terms, the default is the same as the consumer sales terms.

Accounts payable consists of a portion of variable manufacturing costs, cost of goods in intercompany or intracompany buying, and income taxes payable (all taxes have a lag of one period).

Gains and losses may appear for currency exchanges and sales of factories. Unrealized gains and losses appear on the balance sheet when currency fluctuations occur, but the company has not closed out the currency account. When this occurs, the gain (loss) is recognized on the income statement for the period.

Dealing with Other Teams

As in real life, sometimes other teams or individuals make mistakes. Mistakes are an integral part of the INTOPIA game, and oftentimes teams that deal well with these aberrations also do well in the overall game. There are a number of instances where your company may rely on another to ship them product, send them money, etc. Sometimes, a data entry error or a miscommunication may result in adverse effects on one team or another. Furthermore, one small error can have domino-like effects and affect a number of teams for a number of subsequent periods.

The rules in INTOPIA are as follows. **There is no such thing as a verbal contract**. While you may decide to enter into such agreements with teams over the course of the game, they are not enforceable. The first course of action in any dispute is to attempt to deal with the problem with the offending team. Sometimes this does not work. The second step is to ask another team to mediate the negotiations. The third step is to approach the administrator (who in this case, acts as the government, the justice department, etc.). The administrator will make a decision that will be final and non-negotiable.

Above all, remember it's just a game!

Company Output

Each company will receive output by email approximately 30 minutes after the decision deadline. The company output consists of the following:

1) a balance sheet for Home Office and the three operating areas
2) an income statement for Home Office and the three operating areas
3) an management information systems report where one can look at inventory, life of factories, number of sales offices, patents, variable manufacturing costs, intercompany sales, intracompany sales, and unit consumer sales
4) summary of currency holdings
5) cash-flow statements – receipts and disbursements in each area
6) market research items – the three free ones and those ordered by the company
7) a listing of all decision forms that have an impact on the company

A sample of the company output is in Appendix A. An explanation of the main accounts follows, you should follow along with the output.

Balance Sheet

The Balance sheet is divided into five columns: 1 for each operating area in local currency, 1 for Home Office, and a consolidated column typically in the same currency as the Home Office.

Cash: represents the sum of all currency balances in the area. For the operating areas, this will always represent the amount of money on hand in local currency

Accounts Receivable (A/R): Two accounts represent accounts receivable – the first represents cash that will come in during the next period, the second represents cash that will come in the subsequent period.

Inventory: Inventory is represented as standard or deluxe X and Y. This is recorded at **cost**.

Government Securities: This appears on the balance sheet according to the decision made by the firm on the finance forms or home office forms. This amount can be considered cash for the beginning of the next period.

Total Current Assets: A sum of the above accounts – used with current liabilities in the calculation of net working capital.

Net Factory and Equipment: Shows the value of all of the firm's factories in an area, net of depreciation.

Intercompany Investment/Hedge: This account represents loans to other companies by the firm or may represent investment in other companies. This account only appears at Home Office.

Subsidiary Control: This represents the amount of capital that Home Office has invested in all of the subsidiary operations (e.g., Area 1, Area 2, Area 3).

Accounts Payable (A/P): This represents obligations for the firm for the next two periods and likely consists of taxes payable, variable manufacturing costs, and purchases of inventory.

Line of Credit: This is the balance sheet 'plug' and can be thought of as an operating loan. The amount represents the negative cash balance of the firm in the area, plus the interest that accumulates on this negative balance. Interest rates are in the 10 – 15 percent range.

Area Bank Loans: These represent short-term borrowing by the firm to temporarily take care of a cash shortage (without using supplier credit). These loans are for one period only and must be paid back during the next period or re-applied for.

Total Current Liabilities: A sum of the above liability accounts – used with current assets in the calculation of net working capital. Note: net working capital determines the limit on Area Bank Loans (above) to usually around 60 percent of this figure.

Intercompany Loans: This represents loans to the company from other teams in the game.

Bank Loans Payable: This account represents loans to the company from the Central Bank.

Long-Term Bonds: These present the declining balance of bonds issued. Companies may issue bonds of up a prescribed amount (provided by the administrator) per period. The interest rate is typically around six percent and the life of the bonds is 10 years.

Common Stock at Par: This account represents the initial equity of the firm.

Paid-in-Capital: If a firm pays a steady stream of dividends, some shareholders may reinvest dividends in the company. This will appear as paid-in-capital. If this occurs, it is a sign of stock market confidence.

Retained Earnings: Represents cumulative earnings in each of the three areas and home office. RE must be sent back to Home Office to pay dividends. Dividends are deducted from RE and Cash in Home Office.

Home Office Control: This account appears in each of the operating areas and represents the amount (in local currency) that the Home Office has invested in this subsidiary operation.

Unrealized Gain (Loss): This represents amounts of gains/losses due to currency fluctuations that have not yet been recorded. For example, a team may buy a lot of currency 1 in period 1 only to find that its value (relative to other currencies) decreases in subsequent periods. Such a loss in value in recorded here until the currency is sold and the loss is realized (appears on income statement).

Income Statement:

The income statement has eight columns to represent sales of product X and product Y in each of the three areas, income and expenses at the Home Office, and a consolidated statement (in home office currency).

Sales are divided into standard and deluxe sales. All figures on this statement are in local currency. The sales figures represent the sale of inventory at the grade available (the specific grades can be found on the MIS output).

Consumer: These represent sales to the end consumers in the area.

Intracompany: These sales represent sales to other areas within the same company – e.g., shipping product X from area 1 to area 3.

Intercompany: These represent sales to other companies from this area.

Component: These represent sales of components (product X) to product Y factories in the same area for use in manufacturing of Y. These are normally recorded at the average inventory value unless the firm sets a specific transfer price on the manufacturing form.

Commercial and Administration Expense: This account includes all selling expenses including: the cost to open or close a sales office, the periodic expense of a sales office (i.e., the lease fee); and commissions paid to either manufacturing agents or the company's own sales persons (if the company has opened sales offices). The expense is allocated to both product X and Y unless it is clear that the company is only selling one of the two products.

Advertising: Represents the dollar expense of all advertising inputted on the marketing decision form.

Shipping: These are shipping costs – paid for by the selling company. There are no shipping costs with component sales.

Warehousing: These represent inventory carrying costs (i.e., warehousing fees). They increase with an increase in the inventory level.

Sales Expediting Penalties: This represents charges for products that need to be sent to other companies where the company cannot supply enough inventory. This is a penalty for not meeting the contract and ensures that the buyer receives the grade and inventory requested.

Methods Improvement: Represents expenditures towards improving manufacturing such as maintenance and process improvements. Expenditures in this area translate into reductions in variable costs and help offset additions to variable costs such as product obsolescence and factory age.

Depreciation and Fixed: Fixed costs of each factory are recorded here along with depreciation of each factory using a percentage (see DATALOG).

Non-operating Income

Licenses – Product X: Represents income from the licensing of patents for Product X - recorded in Home Office Only

Licenses – Product Y: Represents income from the licensing of patents for Product Y – recorded in Home Office Only

Interest Income: Interest from securities, loans to other companies, or positive cash balances.

Miscellaneous Income: Income recorded from service payments from another firm or from Home Office (these come from form Service Payments).

Non-operating Expenses

Licenses – Product X: Represents payments for the licensing of patents for Product X from other teams - recorded in Home Office Only

Licenses – Product Y: Represents payments for the licensing of patents for Product Y from other teams –recorded in Home Office Only

Interest Expense: Interest from area bank loans, loans from other companies, supplier credit, or negative cash balances.

Miscellaneous Income: Expenses recorded from service payments to another firm or to Home Office (these come from form Service Payments).

Market Research & Other: Represents amount spent on market research items ordered on form Home Office Decisions. Will also include payment for special services entered on the Home Office Decisions Form.

R&D – Product X: Expenses for Research and Development for product X – home office only.

R&D – Product Y: Expenses for Research and Development for product Y – home office only.

Cost of Exchange: Commission paid for exchange of currency – US dollars to Canadian dollars or vice versa.

Realized Gain (Loss): Gains or losses from gain (loss) on sale of factory or from sale of other currencies.

Income tax: Goes to accounts payable. Tax on earnings after accounting for carryover of losses from previous period (see DATALOG for percent).

Dividends: Amount paid out in dividends in the period thereby reducing the amount of earnings.

Management Information System

This section contains information pertaining to inventory, factories, sales offices, and patents. The first section outlines the standard and deluxe product sales. This section is in units. Again, component sales represent the units of product X used in manufacturing of product Y.

The manufacturing cost analysis gives units produced and the variable costs of manufacturing for each of the firm's factories in all three areas. An example appears below.

	Product X	Product Y
PL(1) STANDARD COST	3000000	250000/ 9548700
UNITS	600000	50000

For the output above, it is clear to see that the company manufactured 600,000 units of X and 50,000 units of Y. The variable cost of the Product X is $5/unit $3,000,000/600,000 units). Similarly, the cost of the Ys is around $190 per unit ($9548700 /50,000 units). The number $250000 shown under COMPONENT VALUE represents the cost of the components (i.e., Product X) that went into the making of Product Y. This is also included in the $9,548,700 figure.

The proceeding section outlines the inter- and intra-company purchases in both units and costs. Components expedited represent the amount of Product X that is shipped by a virtual company to make up any shortfalls in this area. This function is sometimes not available in some scenarios.

The ending inventory section is an important one. It outlines exactly what inventory you have available to start next period. It includes products manufactured this period, products remaining unsold from previous periods' inventory, and any products shipped via surface freight during that period. The ending inventory section indicates the number of units and their respective grades for both standard units and deluxe units.

The next section lists the number of factories that the firm has for each product in all three areas. It also lists the factory numbers. This is important if the firm sells off a factory or disposes of one when it gets too old. If for example, the company sells factory one, it must ensure that future manufacturing is specified for factories two or three – not factory one, as it no longer exists. This section also lists the number of sales offices (maximum 9 – including the central office).

The last section on this page gives the current status of the firm's patents.

Appendix A: Cannabis Simulation Details:

Marijuana has been recently legalized in Canada for recreational use and sale. This also means a vast expansion of a diversified and sophisticated market for retail cannabis products. The infancy of the cannabis market means uncertainty for producers and retailers as demand and supply are determined. This will take time as some Canadian citizens are still apprehensive to the idea of recreational marijuana.

The INTOPIA simulation consists of two consumer products:

Marijuana Dried Plant (Product X)

Note: 1 unit of Product X = 3.5 grams of cannabis plants (e.g., flower)

Marijuana Edibles (Product Y)

Note: 1 unit of Product Y = one package of edibles (approximately 70 gummies).

Although there is some resistance that retailers may face, there are numerous opportunities for growers and retailers in Canada. The opportunities lie in product diversification and tailoring through developing new strains and tailoring current strains to better meet the needs of consumers. This type of development is also available for retailers in the form of complex compounds within cannabis strains and ensuring stock levels of varying quality and price. In order to provide these superior strains and finished goods, companies have to spend significant capital into research and development and methods improvement in their production facilities to remain competitive and relevant to consumers.

In the INTOPIA simulation, both product X and Y have their own value in the market and can be marketed differently. A consumer market exists for both products.

There are three large market segments, divided by geographies, that companies can produce and sell within - Eastern Canada, Central Canada, or Western Canada. Each market differs in size, demand, price sensitivity, and manufacturing capacities. Your markets should be chosen strategically as each market will contain different degrees of economic growth and development, consumer behavioural trends, and market volatility. Each company also has a home office. The home office is the center for internal development, where you can purchase market research, invest in research and development, and manage capital.

The Marijuana plant is a component product of Marijuana edibles. Meaning, that if a company produces Marijuana edibles **(Y)**, they must ensure a readily available supply of dried marijuana flower **(X)** to use as the base of their product. Marijuana plants are grown in hydroponic facilities located in all three regions. Edibles are produced from the marijuana plant using one of several processes available (e.g., CO2 extraction) in elaborate processing facilities, also located in all three regions.

There is an abundance of market positions available to pursue in this simulation, including:

- Product Specialists (e.g., dried cannabis plant or edible production)
- Area Specialists (e.g., sales and manufacturing only in Western Canada)
- Research and Development Specialists (e.g., specializing in R&D and selling licenses to manufacturing firms)
- Financial Institutions (e.g., Banks who provide loans to other companies)
- Wholesalers (e.g., companies that purchase products X and Y from manufacturers and sell directly to consumers via sales offices (i.e., dispensaries)
- Integrated Company (manufacture and sell both dried cannabis plant and cannabis edibles).

The companies that choose to manufacture, either **X, Y or both**, and wish to sell their goods have three options:

1. Sell directly to end consumers by posting prices and using sales agents, or by opening sales offices (i.e., dispensaries).
2. Sell to wholesalers who will in turn sell the goods to end consumers through their dispensaries.
3. Sell to other companies. i.e., Producers of dried marijuana plant **(X)** will likely sell their product to edibles producers **(Y)** as it is a necessary input to produce **Y**.

Each selling option brings your product to market differently. It is imperative to be strategic about which channel you choose to utilize, so that it aligns with your company's goals and overall strategy. Some channels will cost more to run but will yield higher market prices. While other channels are less expensive to use, they could reap a lower per-

unit selling cost. The network you develop through the course of the simulation will be a determining factor of success.

Marijuana plants are a consistently changing commodity. New strains are being manufactured, while current strains are altered and cross bred. The marijuana plant **(Product X)** is both a consumer good, and a manufacturing input for other marijuana products, such as edibles **(Product Y).**

3.5 grams of marijuana plant **(i.e., 1 units of Product X)** is required to make a package of edibles **(i.e., 1 unit of Product Y).** Higher grades of Y may require less or more components (i.e., plant material as the extraction process becomes better)

The dried marijuana plant has nine levels of product improvement. These levels of improvement are achieved through Research and Development. With each grade increment, the value of the plant, its potency (i.e. THC or CBD), and its bioactive profile (i.e. terpenes, flavonoids) will increase. Thereby, increasing its market value, and the value of the edibles **(Product Y)** made from it. For example, a Grade 0 Dried plant will have minimal taste, potency, and a simple bioactive profile. As the grades increase, so to will the quality of the plant, creating higher selling prices in the market and better inputs for higher grade edibles **(Product Y)**

Edibles (e.g., gummies) are a finished good product that are made using marijuana plant for its THC and CBD compounds, among others. Like the cannabis plant, edibles have nine levels of product improvement. As companies invest in research and development, they can increase the quality (i.e., grade) of their finished product. Increasing the grade will allow the company to meet demand for higher grade products and to sell them to consumers at higher prices, however this is all contingent on market trends, and saturation.

Once the necessary facilities are in place, each manufacturer, for **both X and Y,** will begin the simulation producing grade 0 which is the initial grades for **products X and Y**. (ex., X0 and Y0). As the simulation progresses, grades can be increased through research and development patents. These patents give the manufacturer the licence to produce a specific grade of X or Y.

If a company wishes to produce higher **product Y** grades, they will need to source equivalent or similar **product X** grade inputs (e.g., an X1 or X2 will be required to produce a Y2 – see the DATALOG for an X-Y conversion chart)

Although **product X** does not require any inputs, it is still important to increase product X grades to meet the demand of wholesalers, channel partners, customers, etc.

The Cannabis Industry

The INTOPIA simulation is formulated to mimic actual business operations as much as possible. There are some aspects of the game that will seem to obfuscate this reality. Whatever is taking place outside of this simulation (e.g., actual market conditions, economic climate, unforeseen events) may or may not be reflected in the INTOPIA simulation. The world of INTOPIA exists within itself for the period of the simulation – reality is considered another planet for the game.

Some things that may seem a bit unrealistic are as follows:

1) Manufacturing taking a period – Why can't some units be made available during the period for sale? Because they just can't, that's why – deal with it!
2) Why does surface freight take an entire period in Western Canada when trucks can travel across Canada in two days? – Because it just does, deal with it! Pretend all the trucks are Fords!
3) Interest rates are crazy on the line of credit. Have you looked at your credit card statement lately?

The size of the three markets and the nature of demand are meant to mimic that of real-life. Here are the details on each of the three areas:

Eastern Canada

Eastern Canada (EC) has the highest demand for marijuana per capita and is one of the larger markets. Demand is high due to many regular users, who consume on average 0.76 grams/day. These users are interested in newer and well-developed strains, that are widely available and reasonably priced. This market is also interested in diversifying their cannabis experience through marijuana products like edibles. This market is more vulnerable to layoffs, strikes, and economic slumps. This creates some volatility in the market as income and job security are not consistent.

Manufacturing is cheaper in Eastern Canada due to availability of facilities and the lower barriers to entry (i.e., start-up cost, physical location). Companies that enter this market can take advantage of the cheap manufacturing, with one disadvantage – consumers in this area are more price sensitive and expect to pay less for products and demand cheaper goods. Due to this price sensitivity, consumers in this market are skeptical to adopt new and expensive strains, meaning that intense advertising is needed to push purchase decisions. Therefore, high-end edibles and plants have a weak market in Eastern Canada.

Central Canada

Central Canada (CC) is the test market for new products. This is because large growers have their flagship operations based in Ontario and Quebec, meaning that these markets are the first to try new products. Although these consumers try more new products, there is a greater number of reluctant buyers in this market, which means they are more apprehensive

to adopt higher grades of marijuana products. These consumers are slow to change and not receptive to advertising.

Central Canada is the hub of government activity, and therefore the consumers in this area are more easily influenced by legislative movements and lobby groups against recreational marijuana usage. This may affect the sale of marijuana and marijuana-made products in this area.

Western Canada

Western Canada (WC) has the lowest retention rates in Canada. The market in this area is very broad, and consumers expect many options available to purchase (varying grades available). There is a significant number of chronic users in Western Canada; therefore, this market craves new and better-quality products. They will demand higher quality strains and products but will also be willing to pay more for them. This market is interested and willing to buy new products, and therefore very responsive to advertising. Western Canada has higher cost related to manufacturing but has a less volatile market than Eastern Canada.

Logistics and Shipping

The airlines in the INTOPIA game are like those in real-life. There may be one major carrier that is experiencing severe difficulty with financial operations. This may affect the Marijuana industry in one of three ways:

1) airfreight may become unavailable for some periods;
2) airfreight may become more expensive; or
3) airfreight may become more expensive as companies begin to rely on smaller carriers.

As a new and expanding market in Canada, Cannabis is in high demand, and so will the developments for higher quality products that produce a better more meaningful experience for the consumer. Cheaper strains will be less potent, and customers can eventually become dissatisfied. Generally, the more a marijuana user uses, the stronger their biological tolerance will be, meaning users will require more cannabis, or higher quality Cannabis (more THC) to achieve the high feeling. This concludes that consumers who demand higher strains will notice if the product is not up to par and will not settle for lower quality products.

Starting Capital

At the beginning of the game, teams will be provided with an amount of starting capital (shown on the balance sheet as Common Stock at Par) depending on their initial strategy.

Decision Periods

Each decision period can be considered to be one year of operation.

Appendix B: Frequently Asked Questions

How do I Build a Factory?

Under the category PRODUCTION, choose Build a New Plant. Specify the number of each type of factory that you wish to build. The cost of the factory is deducted in local currency from the cash account in that area. An X factory can produce at half capacity in the period of construction. A Y factory takes one period for construction. In the next period, it will be "on stream" and ready for manufacturing of your highest producible grade (or lower). Each company is limited to three factories of each type in each area. Once you build a plant, it will remain with you until you sell it.

How do I Sell Product in a Market?

In order to sell product in a market, you must have inventory in that area and you must post a consumer price.

The following are ways in which a company may have inventory in a period:
1. it was produced by the same company in its local factories the previous period
2. it was sent via surface freight last period (by another company or one of the company's foreign factories) -this will appear on the Inventory output as ending inventory
3. it was sent via air freight this period (by another company or one of the company's foreign factories)
4. it remained in inventory from last period (and will appear on the Inventory output)

To sell product in a market, select the MARKETING and SALES category. Choose either SET A CONSUMER PRICE FOR X or SET A CONSUMER PRICE FOR Y. Price according to what you have in your ending inventory from the previous period (taking into account what may be arriving by air). If you have only one model (i.e., one grade) in inventory, set a price in the *Lowest (or only) Grade of X available in inventory*. If you have two grades, set both a price in both boxes if you want to make both available for sale to consumers. Sale agents will automatically sell product for you. Nominal prices at the beginning of the run are listed in the DATALOG.

How do I Transfer Money (Capital) to an Area?

Select the FINANCE category and choose TRANSFER CAPITAL OR EARNINGS. Select the area to which you wish to transfer money to. Choose the transfer type, *Transfer To Area from HO.* Enter the amount that you wish to transfer in 000s. Choose the currency of the transfer (e.g., US$). The conversion in area? option can be selected if you are using something other than the local currency – this will automatically convert it into the local currency.

How do I Manufacture X?

To manufacture X, you need a factory in an area that is "on stream". An "on stream" factory is one that was constructed last period or has been purchased from another company. Select the PRODUCTION category and choose PRODUCE X. Specify the

grade of your lowest grade of production. Specify the units of manufacturing (in thousands of units only) beside the number corresponding to the factory in which you wish to produce. If only one grade is manufactured, it is always your lowest grade regardless of its grade. You may produce two grades in the same factory however; you will experience higher variable costs.

How do I Deal with Inventory?

Each team has two "storage bins" for each area and each product in which inventory may be placed. In other words, only two grades of inventory can be held in one area at one time. Should a third grade of inventory arrive in an area, the medium grade product will be downgraded to the lowest grade. For example, suppose company A has 10,000 units of both X1 and X2 in its inventory at the beginning of period two. In period two, it sells all but 1,000 units of X1, all but 3,000 units of X2 and produces 10,000 units of X3. In this situation, the 3,000 units of X2 would be downgraded to X1.

How do I Transfer Money to Home Office?

There are three options for sending money to the home office:

1. In the FINANCE category, select TRANSFER CAPITAL OR EARNINGS. Select the area from which you will be transferring money. Transfer money using the *Transfer to HO from AREA* option under Transfer Type. Enter the amount of the transfer in thousands (000s). Select a currency for the transfer. The transfer cannot exceed the amount reported in the HO Control Account for that area. The conversion in area? option can be selected if you are using something other than the HO currency – this will automatically convert it into the HO currency when it arrives in HO.
2. In the FINANCE category, select TRANSFER CAPITAL OR EARNINGS. Select the area from which you will be transferring money. Transfer money using the *Send Back Earnings to Home Office* option under Transfer TYPE within an area. Enter the amount of the transfer in thousands (000s). Select a currency for the transfer. The transfer cannot exceed the amount reported in the Retained Earnings Account for that area. The conversion in area? option can be selected if you are using something other than the HO currency – this will automatically convert it into the HO currency when it arrives in HO. This will decrease the Retained Earnings account and the cash account in the area while increasing cash and Retained Earnings in the Home Office.
3. In the FINANCE category, select MAKE A SERVICE PAYMENT TO HOME OFFICE. Other service payments to home office in this period will appear on this screen. Click on ADD NEW to make a new service payment. Select the area from which the service payment will be made. Select an amount in 000s. Select a currency in which the service payment will be made. The area will report a miscellaneous expense while the Home Office will report miscellaneous income. There are often tax advantages to this move. The service payment is limited to between 10 and 20 percent of the HO control account. See the administrator for the actual limit.

How do I Produce Y

With X as a component of Y, an inventory of X is required to produce an inventory of Y. The DATALOG provides an X-Y conversion table that specifies the number of units of a specific grade of X that are required to produce a single unit of a specific grade of Y.

To produce Y, select the PRODUCTION category. Select the lowest grade of your upcoming production plan and enter the quantity of that grade in 000s that you wish to produce in the textbox corresponding to the appropriate plant number. If you are only producing one grade, use the *Lowest Grade* for production. If you have two compatible grades of X in inventory, you may wish to choose the order in which they are used for Y production. For example, if X1 is cheaper than X0 and both can be used to produce Y1, a company may wish to use up its X1 in production of Y first. To do so, they would select *highest grade first* in the *processing priority of components* section. Similarly, if they had limited X available that was compatible with both a low grade and a higher grade of Y, they may wish to prioritize the production of the higher grade. To do so, they would select *highest grade first* in the *processing priority of Product Y section.*

A component transfer price can be used if you wish to sell your components to your Y plants at a price of something greater than the variable cost. This may be done to show the true cost of X (e.g., to include other items such as methods improvement and R&D) in the production of Y. For example, a team may find that their variable costs of X are $20 per unit. However, the true cost of X is closer to $40 when they include fixed costs such as methods improvement, research and development, fixed costs of plant, and depreciation. Therefore, the team sets a transfer price of $40 for their components. If nothing is put in the component transfer price, the variable cost is used.

How do I Pay Dividends, Get Paid-In Capital, Buy Back Shares?

In order to pay dividends, a company must have positive Retained Earnings in the Home Office. This is most easily accomplished by Sending Earnings from the Areas to Home Office using send back earnings to HO option on the Transfer Capital screen (see How do I transfer money to Home Office?). As a company gets positive Retained Earnings it may wish to pay dividends. The advantage to paying dividends is that the shareholder goodwill increases. Continual and consistent payment of dividends leads to re-investment of dividends (and perhaps further capital) by shareholders. This appears on the balance sheet as Paid-in Capital. This is the only way a company can increase its level of Equity. The issue of more common stock and the buy-back of common stock is possible; however, it is an administrator-controlled function. To pay dividends, select the FINANCE category, then select PAY DIVIDENDS. Enter the amount of dividends in 000s (note this is a total amount in home office currency (e.g., $US), it is not a per-share amount).

How do I create a Sales Organization?

A sales organization is formed by the opening of sales offices in an area. Sales are normally handled by outsourced agents until such a time that a company begins to open sales offices. A sales organization consists of a central office and between 1 and 8 other regional offices. When a company begins to utilize a CSO, they will incur a fixed cost per office, plus a per-unit cost for each unit sold. The first office opened normally costs more than subsequent offices (see the DATALOG for costs), since it represents your central office. Opening multiple sales offices in one period results in additional costs – i.e., it is more economical to open sales offices incrementally (i.e., one at a time) rather than all at

once. The optimal number of sales offices for a given quantity of sales can be realized through market research item #81.

How do I Buy a Factory from another Company?

Factories may be purchased (or sold) from (to) other companies. To sell a plant, select the INTERCOMPANY TRANSACTIONS category and choose SELL A PLANT TO ANOTHER TEAM. The selling firm uses the plant sale form after consultation with the purchasing team. The selling team must be aware of the number of the factory that it has sold so that it does not attempt manufacturing in this factory number in the future. Plant numbers do not reset after the sale of a plant. The factory that has been purchased is immediately "on stream" provided that it is at least two periods in age. Inventory is not included with the sale. The use of the plant sale form includes the monetary transaction from the buyer – i.e., the buyer does not need to do anything to receive the plant (i.e., do not use a service payment to pay for the plant – unless you want to pay twice).

How do I Send Earnings Back to Home Office?

Repatriation of retained earnings is another method of transferring money (capital) back to Home Office. Typically, there are few activities in the HO that generate revenue (apart from License income and Interest). As a result, cash reserves in HO dwindle quickly and earnings are generally negative. Positive retained earnings are necessary for dividends; therefore, repatriation of these earnings becomes a priority. In the FINANCE category, select TRANSFER CAPITAL OR EARNINGS. Select the area from which you will be transferring money. Transfer money using the *Send Back Earnings to Home Office* option under Transfer TYPE within an area. Enter the amount of the transfer in thousands (000s). Select a currency for the transfer. The transfer cannot exceed the amount reported in the Retained Earnings Account for that area. The *Convert Foreign Currency to Local Currency* option can be selected if you are using something other than the HO currency – this will automatically convert it into the HO currency when it arrives in HO. This will decrease the Retained Earnings account and the cash account in the area while increasing cash and Retained Earnings in the Home Office.

How do I Become a Wholesaler?

A wholesaler has the following advantages: 1) increased marketing effectiveness, 2) no goodwill losses due to stockouts; and 3) lower inventory carrying costs. In order to be a wholesaler, the company cannot be a producer in the area in which they are a wholesaler, must sell both X and Y to the end consumer, and they must maintain a minimum of three sales offices. To become a wholesaler, select the SPECIAL SERVICES category and choose REGISTER AS A WHOLESALER. Click the *Register* button to register your team as a wholesaler in that area.

How do I Get a Bank Loan (Home Office)?

Home Office Bank Loans are handled by the administrator. To request a loan, select the SPECIAL SERVICES category and choose REQUEST A LONG-TERM LOAN FROM THE CENTRAL BANK. Enter details regarding the loan on this form and press submit request. The administrator will contact you to arrange a loan conference. Filling out this

form does not guarantee that you will receive the loan. Often the administrator will require a formal application that includes projected statements.

How do I Make my factories more efficient?

The capacity of each factory is displayed in the DATALOG. The optimal capacity is not the same as the capacity, thus manufacturing at capacity levels does not always yield the lowest per-unit cost of manufacturing. By investing in methods improvement, a team can expect unit manufacturing costs to decrease and optimal manufacturing levels to increase. To spend on methods improvement, select the PRODUCTION category and choose IMPROVE METHODS OF PRODUCTION. Select the area in which you wish to improve production methods (i.e., lower variable costs). Enter an amount in 000s for methods improvement. This amount works towards all plants of that type (X or Y) in the region.

How do I Make a service payment to Home Office?

Service payments to Home Office are an excellent way to avoid taxes and to increase retained earnings in the home office. In the FINANCE category, select MAKE A SERVICE PAYMENT TO HOME OFFICE. Other service payments to home office in this period will appear on this screen. Click on ADD NEW to make a new service payment. Select the area from which the service payment will be made. Select an amount in 000s. Select a currency in which the service payment will be made. The area will report a miscellaneous expense while the Home Office will report miscellaneous income. There are often tax advantages to this move. The service payment is limited to between 10 and 20 percent of the HO control account. See the administrator for the actual limit.

How do I Get an Area Bank Loan?

Area Bank Loans require no pre-approval and are limited to a certain percentage of Net Working Capital (see administrator). This is generally around 60 percent. You need not get administrator approval for this type of bank loan. To calculate your eligibility, look at the previous periods' output and calculate the area's net working capital (current assets less current liabilities). To get the loan, go to the FINANCE category and choose GET AN AREA BANK LOAN. Select the area and enter the amount of the loan in 000s. This loan is paid back automatically next period (you need not do anything).

How do I Transfer Products from my factories in one area to my sales offices or factories in another area?

When you are selling products to yourself – e.g., shipping from one area to another – this is called an intra-company sale. To do this, select the INTRA-COMPANY transactions category and choose either SEND YOUR X TO ANOTHER AREA or SEND YOUR Y TO ANOTHER AREA. This will take you to a screen that lists all of your intra-company sales. You can edit previously entered decisions on this screen or you can choose ADD NEW to add a new intra-company sale.

Select the area from which the product is being sent and the area to which you are sending the product. Enter the quantity in 000s of units and the price at which you are

selling the units. Oftentimes teams attempt to sell from one area to the other at a very low (i.e., less than cost) price. This is not permitted in the game. You must transfer the product at above your costs of production. These costs should include variable costs and other relevant fixed costs (e.g., methods, depreciation, fixed costs of plant, shipping costs). Failing to do so is akin to tax evasion.

How do I Set transfer prices for component products - in local areas and from other areas?

Transfer prices for component products are set on the PRODUCE Y form (at the bottom). This does not need to be done but can be done to truly reflect the cost of the components (see How do I Produce Y).

How do I License a Patent?

A patent license transfers ownership and ability to produce to the licensee. This is accomplished via a one-time, lump-sum payment only. The license can be sub-licensed unless an agreement is made between the licensor and licensee.

To enter an unrestricted license, select the R&D AND LICENSING category and choose SELL AN PATENT LICENSE. The next screen will show all of your licenses for this period. To add a new license, click on the Add New License button. Enter the company number of the licensee and select the product and grade you wish to license. Next enter the amount of the license fee in 000s.

How do I Order and Interpret Market Research Items?

Market Research Items can be ordered through the marketing category. The price of each item is listed on the DATALOG.

How do I sell product to another Team?

Selling product to another team is called intercompany sales. To sell product to another team, select the INTERCOMPANY TRANSACTIONS category and choose either SELL X TO ANOTHER TEAM or SELL Y TO ANOTHER TEAM. The next screen will take you a list of your intercompany sales this period. You can update or delete transactions on this screen. To make a new intercompany sale, choose the Add New button at the bottom of the page. Enter the number of the team to whom you are selling. Select the area from which you are shipping product. Next, select the area to which you are shipping product. Note that the selling team (you) pays for shipping. Shipping will appear on your income statement. Select the grade and quantity (in 000s). If you are trying to ship 12, 231 units, you should round up completely (set the units at 12.24 – i.e., ship a little bit more to completely exhaust your units). Select the currency and the method of shipping (e.g., surface – one period, airfreight – current period). Select the payment terms by entering integers (e.g., 100, 40, 50) into the next three boxes (Cash, A/Rt+1, A/Rt+2). These boxes represent the amount of cash that you will receive in the current period, the next period, and the next period after that. These must sum to 100. Once you press SAVE, you will be taken back to the intercompany sales summary screen. You can edit your sale there if you have made a mistake. Note that this form

takes care of both money and product. The buying team does not need to enter a service payment to take care of payment.

How do I send a service payment to another team?

Service payments are to be sent to other teams for specific purposes only. They are never used for the payment of products or for fixed assets (e.g., the purchase of plants) or for lending another team money. The effect of a service payment to another team is a miscellaneous income recorded by the receiving team (and cash) and a miscellaneous expense recorded by the sending team (and cash). So, there are tax implications with the use of service payments. The most common uses of service payments are as follows:

1) The transfer of money to be used in R&D expenses by the coordinating team of a patent pool.
2) A payment for the sharing of market research items between teams
3) A payment to a team for the breach of a contract or a mistake made in a transaction that costs the other team money.

To make a service payment to another team, select the INTERCOMPANY SALES/TRANSACTIONS category and choose MAKE A SERVICE PAYMENT TO ANOTHER TEAM. Other service payments to teams in this period will appear on this screen. Click on ADD NEW to make a new service payment. Enter the team number to whom you wish to make the service payment. Select the area from which the service payment will be made. Select an amount in 000s. Select a currency in which the service payment will be made. In the text box beside the label *Purpose of the Service Payment,* enter a description of the purpose of the service payment. These are reviewed by the administrator to ensure that they are legal transactions. The area sending the service payment will report a miscellaneous expense while the other team will report miscellaneous income in the area in which it is received.

What is the capacity of a sales office?

Sales offices don't really have a capacity. Each additional sales office results in some additional sales; however, one sales office can handle all of your sales. The optimal number of sales offices can be obtained by ordering Market Research Item #81. Watch the market research video to see how to interpret this.

How do I pay off accounts payable in an area?

Accounts payable occur because of taxes, a portion of your production costs, and a portion of your intra- or inter-company sales as specified on the shipping forms. You don't have to do anything in particular to pay off accounts payable, this will happen automatically in subsequent periods. The Accounts Payable will be deducted from your cash account in the area, so you should ensure that there is sufficient cash to do this (or you will use your line of credit)

How do I pay off my line of credit in an area?

Similar to accounts payable, you don't have to do anything in particular to pay off your line of credit. A LOC occurs because you don't have sufficient cash in the area. Transfer sufficient cash to the area and this will effectively wipe out your LOC.

How do I cash out securities?

Securities are automatically cashed out at the beginning of the next period. For example, securities invested in period 1 will appear on the period 1 balance sheet under GOVERNMENT SECURITIES and interest income will be recorded on the income statement. At the beginning of period 2, the securities are cashed out automatically and the cash is available for use in period 2.

How do I pay a bank loan (principal or interest) through the central bank or another team?

Payment of principal and interest for all loans is done automatically. All you need to do is ensure that you have sufficient cash to do so (or your line of credit is used).

How do I pay for product sent from another team?

Payment for products sent from another team is done automatically (i.e., the shipping form filled out by the other team does this). All you need to do is ensure that you have sufficient cash in the area in which the goods will be received (or your line of credit is used).

How do I pay for a license sent by another team?

Payment for licenses sent from another team is done automatically (i.e., the licensing form filled out by the other team does this). All you need to do is ensure that you have sufficient cash in the home office to pay for the license fees (or your line of credit is used).

How do I send money from one area to another?

To send money from one area to another, you must go through home office. To do this, make a capital transfer from one area to the home office and then make a capital transfer from the Home Office to the other area. This can all happen in the same period.

Appendix C: Timing issues in the INTOPIA Simulation

Activity	Timing	Implications
Cash Transfers	Instant	Payments and transfers are made right away
Securities	Cash out at the beginning of next period	Cash is available for use next period
Area Bank Loans	Paid automatically at the beginning of next period	Cash is required for next period
Construction of Plant	1 period (for Y plants) ½ period (for X plants – you can produce at half capacity in the period of construction)	You must wait to produce for Y– depreciation and fixed costs will not be incurred. You can produce at half capacity for X – depreciation and fixed costs will be incurred in full in the period of construction
Production of Inventory	1 period – inventory goes to warehouse at end of period	You can never produce and ship/sell the same inventory in a period
Shipping by air	Occurs at the beginning of the period	Inventory can be received by other teams and used right away – you cannot, however, send it to someone else by air
Shipping by surface	Arrives at the end of the period	Inventory will appear on your output that period as ending inventory – not available for use until next period.
Licenses	License takes one period to fulfil – firm grants license in period t – licensee can use license in t+ 1 – assumes licensor already has patent in period t	Licensing, while generally cheaper, requires teams to wait.
Open/Close Sales Office	Takes one period to open/close	Company incurs costs to open or close in period t – leasing costs begin in period t+1
Register as wholesaler	Takes one period to have effect	

Appendix D: Performance Assessment

Your team's performance during the simulation ultimately determines your grade. The grade you will receive is anchored on Value Added and adjusted for other variables (see the table below for possible adjustments to value added). Value Added will be compared against other firms with similar strategies – e.g., X producers will be compared against other X producers.

Value Added is a measure that assesses the amount of earnings that your team has been able to achieve over the duration of the simulation. It is calculated as follows:

Value Added = Ending Equity – Beginning Equity

Ending Equity = Common Stock + Retained Earnings + Paid in Capital

Beginning Equity = Common Stock

The measure of value added assesses how much value you have created for your shareholders. Ending Equity provides a measure of how much the firm is currently worth (i.e., its value). Beginning equity (displayed on the balance sheet as common stock) represents the firm's starting capital.

A firm's value added can be seen on the website under the Results section. Choose "see Value Added Chart".

Value Added Chart

Period: 8 Strategy: (all)

Company	Value Added	Strategy
5	$410,977	I
2	$232,273	Y
9	$197,527	I
15	$133,891	RD
3	$129,457	X
8	$120,775	WS
16	$114,377	WS
11	$88,159	X
10	$65,145	X
4	$43,989	I
14	$24,963	WS
12	$22,999	X
6	$4,584	X
7	$3,530	X
13	($44,137)	I

Back

Ways to increase Value Added:

A team can increase value added by doing a number of things. First and foremost, a team needs to be profitable – this, in turn, increases retained earnings which affects Ending Equity. To be more profitable, teams need to sell more items (e.g., products or licenses) or sell at a greater margin (e.g., reduce variable costs, use premium pricing with higher grades/advertising). Paying dividends may also increase value added by encouraging re-investment of dividends by its shareholders in the firm. This re-investment is shown on the balance sheet as Paid-in-Capital. Consistent profitability and a steady stream of dividends will increase the likelihood of receiving Paid in Capital.

Given two teams with the same or similar value added, their overall performance assessments may differ for a number of reasons.

Possible Adjustments to Value Added as basis of performance assessment (relative to peer group)

Criteria	Description	Measures
Performance	Earnings/Value Added relative to similar firms in the industry.	1. ROA (better ROA signifies better efficiency) 2. ROE (better ROE signifies better use of shareholder investments) 3. Pursuing growth (see note below)
Future Performance	Sustainability of firm in short- and long-term future.	1. Value Added growth trajectory - even performance is better than sporadic performance 2. Plans for growth / sustainability – new plants in later periods, etc. 3. Market Share (scope and scale). a. For producers, scale and scope are % sales in a region (B2C, B2B), % of plants in a region b. For wholesalers, scale is %sales in a region and % of sales offices in a region c. For R&D firms, scale is % licensing revenue of licensing firms. 4. Competitive Advantage (low cost, differentiation)
Relationships	Inter-organizational networks	**For wholesalers:** 1. Supplier network size 2. quality of supplier network (i.e., better performing suppliers implies a more sustainable network) **For producers:** 1. quality of supplier &/or client network for B2B (i.e., better performing suppliers and clients implies a more sustainable network)
Knowledge of game	Preparedness of team, knowledge of procedures, and knowledge of industry.	1. Line of credit use 2. Sales expediting charges 3. Game Errors (other than line of credit or sales expediting) 4. Use of market research 5. Consistency in performance
Adaptability and Sociability	Ability to react positively to environmental change.	1. Quality of Interactions with other teams judged by B2B ratings. Teams must submit ratings for all B2B transactions. Comments are optional, but justification may be demanded by professors or Tim. 2. Reactions to events

Pursuing Growth versus Paying Dividends

Teams are rewarded for pursuing growth opportunities (e.g., entering new markets, expanding operations) rather than paying dividends. Teams that carry excessive amounts of cash (e.g., more than $40 million) over several periods, may be forced to pay dividends.

Appendix E: Sending Cash Back to Home Office – Three Ways

Method	Journal Entries	Form on INTOPIA Website	Advantages/Disadvantages	Limitations
Send back retained earnings	**Area**: Retained Earnings (DR) Cash (CR) **Home Office:** Cash (DR) Retained Earnings (CR)	Capital Transfer (Finance) – select Area Earnings -> Home Office	Advantages: This will help to get Retained Earnings to be positive in the home office so that you can pay dividends.	Limited to the amount of the Retained Earnings Account (Area) on the previous period's output. For example, to send money back to Home Office from Area 1 in Period 5, you are limited to the value of the RE account in Area 1 on Period 4's output.
Send back capital	**Area:** Home Office Control (DR) Cash (CR) **Home Office:** Cash (DR) Subsidiary Control (CR)	Capital Transfer (Finance) – select Area -> Home Office	Disadvantages: This will put restrictions on the amount you can transfer back to HO via service payment	Limited to the amount of the Home Office Control Account (Area) on the previous period's output. For example, to send money back to Home Office from Area 1 in Period 5, you are limited to the value of the HO Control account in Area 1 on Period 4's output.
Send service payment to Home office	**Area**: Miscellaneous Expense (DR) Cash (CR) **Home Office:** Cash (DR) Miscellaneous Income (CR)	Send Service Payment to Home Office (Finance)	Advantages: Tax rate is generally lower in HO than in area so this helps to lower taxes. This will increase RE in HO through earnings so the potential to pay dividends is also there. Disadvantages: You are limited to a certain percentage of the HO account.	Limited to a percentage of the Home Office Control Account (Area) on the previous period's output (usually 10%). For example, to send a service payment to Home Office from Area 1 in Period 5, you are limited to 10% of the value of the HO Control account in Area 1 on Period 4's output.

Note: in all three methods, 2 accounts are affected in both the home office and the area. If you have insufficient cash in the area, you will incur a line of credit. If you exceed the limits specified, there is no warning, the amount will be reduced. If RE is negative, no transfer will occur. Similarly, if the area home office control account is 0, no transfer will occur.

Appendix F: Accounting for Component Costs

Activity	Accounts	Debit	Credit	Notes
Y producer receives a shipment of components from another company by air	Cash (or payables)		XX	Components (i.e., X) are initially inventoried
	Inventory of X	XX		
Producer uses components in production of Y	Inventory of X		XX	Inventory of X is removed from warehouse and recognized as a component sale
	Component Sales	XX		
	Cost of Goods Sold of X		XX	The X removed as component sales are expensed as a cost of goods sale. This usually appears with a gross margin of 0 on the income statement unless the team elects to set a component transfer price higher than costs of acquisition of the X
	Inventory of Y	XX		Component costs are added to inventory of Y
	Cash or payables		XX	Payment for additional costs of producing Y (i.e., incremental costs)
	Inventory of Y	XX		This is the incremental costs of producing Y – i.e., the costs above the component costs
Producers sells its inventory of Y in period t+1	Cash or receivables	XX		
	Inventory of Y		XX	Inventory removed when sold
	Consumer Sales of Y		XX	
	Cost of Goods Sold of Y	XX		Cost of Goods Sold includes component costs and incremental costs of Y production (at cost)

Appendix G: RISKS

A global risk is an uncertain event or condition, that if it occurs, can cause significant negative impact for several countries or industries within the next 10 periods.

			Probability		
Category	Risk	Description	Eastern Canada	Western Canada	Central Canada
Economic	Failure/shortfall of critical infrastructure	Failure to adequately invest in, upgrade and secure infrastructure networks (e.g. energy, transportation and communications) leads to pressure or a breakdown with system-wide implications.	Low	Moderate	Low
	Fiscal crises in key economies	Excessive debt burdens generate sovereign debt crises and/or liquidity crises.	Moderate	High	Moderate
	High structural unemployment or underemployment	A sustained high level of unemployment or underutilization of the productive capacity of the employed population prevents the economy from attaining high levels of employment.	Moderate	High	Low
	Severe energy price shock	Severe energy price shock (increase or decrease) Energy price increases or decreases significantly and places further economic pressures on highly energy-dependent industries and consumers.	Moderate	High	High
	Unmanageable inflation	Unmanageable increase in the general price level of goods and services in key economies.	Moderate	Moderate	Low
ENVIRONMENTAL	Extreme weather events	Major property, infrastructure and environmental damage as well as human loss caused by extreme weather events.	Moderate	High	Moderate
	Man-made environmental catastrophes (e.g., oil spill)	Failure to prevent major man-made catastrophes, causing harm to lives, human health, infrastructure, property, economic activity and the environment.	Low	Moderate	Moderate

Industry-Specific Risks

An Industry-specific risk is one that is expected to have an impact on the industry (e.g., smartphone) industry as whole sometimes impacting demand, supply, and competition within that specific industry.

			Probability		
Category	**Risk**	**Description**	**Central Canada**	**Eastern Canada**	**Western Canada**
Demand	Origin Effects	A major shift in consumer preference away from a particular region.	Low	Moderate	Moderate
	New Product Innovation	An emergence of a new product/innovation that shifts consumer demand away from existing products/grades. This could also include the introduction of substitute products.	Moderate	Moderate	Moderate
Supply	Component Oversupply	An overabundance of production in components leading to price wars and substantive inventory holding costs.	Low	Low	Low
	Labour disruptions – manufacturing	The presence of unions and the probability of temporary and/or long-term disruptions in production due to labour actions (e.g., strikes, lockouts). This could include disruptions to the timing of plant construction.	Low	Moderate	Low
	Labour disruptions – transportation	The presence of unions and the temporary disruption of transportation due to labour actions (e.g., strikes, lockouts)	Moderate	Moderate	Moderate
	Natural events	Disruption of production and/or loss of inventory due to natural events (e.g., fire, tornado, flooding)	Moderate	Moderate	High
Competition	Emergence of New Major Competitor	The emergence of a new player in the industry with significant resources and the ability to significantly alter price structure, market distribution, and/or	Moderate	Moderate	Moderate
	Patent legislation	Introduction of new legislation surrounding patents, patent pooling, and research and development drastically affecting the competitive landscape.	Moderate	Moderate	Moderate
	Market legislation	Establishment of regulations around pricing (e.g., ceilings, floors), advertising, and/or market entry.	Moderate	Moderate	Moderate